Investments Unwrapped: Demystifying and Automating Technical Analysis and Hedge-Fund Strategies

by

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Submitted to the Department of Electrical Engineering and Computer Science
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

February 2007

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Abstract

In this thesis we use nonlinear and linear estimation techniques to model two common investment strategies: *hedge funds* and *technical analysis*. Our models provide transparent and low-cost alternatives to these two nontransparent, and in some cases prohibitively costly, financial approaches. In the case of hedge funds, we estimate linear factor models to create passive replicating portfolios of common exchange-traded instruments, that provide similar risk exposures as hedge funds, but at lower cost and with greater transparency. While the performance of linear clones is generally inferior to their hedge-fund counterparts, in some cases the clones perform well enough to warrant serious consideration as low-cost passive alternatives to hedge funds. In the case of technical analysis – also known as "charting" – we develop an algorithm based on neural networks that formalizes and automates the highly subjective technical practice of detecting, with the naked eye, certain geometric patterns that appear on price charts and that are believed to have predictive value. We then evaluate the predictive ability of these technical patterns by applying our algorithm to stocks and exchange rates data for a number of stocks and currencies over many time periods, and comparing the unconditional distribution of returns to the return distribution conditional on the occurrence of technical patterns. We find that several technical patterns do provide incremental information, suggesting that technical analysis may add value to the investment process. To further demystify the highly controversial practice of technical analysis, we complement our implementation and validation study with a historical overview of the field and interviews with its leading practitioners.

Thesis Supervisor: Andrew W. Lo
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Acknowledgments

Professor Lo was a better advisor than what I could have ever imagined. He guided me through my graduate education with great care and endless encouragement. He was very supportive of my industry-oriented career goals, and always ensured that I was happy with both my academic endeavors and personal life. His contribution to every aspect of this thesis is immense; he taught me an incredible amount about doing and presenting research, and interacting with both the academic and professional communities. His unparalleled generosity and undaunted pursuit for clarity gave me the ideals to strive for during my entire life. For all this, and for his trust in me, I will be eternally grateful.

Special thanks go to Mike Epstein, currently a visiting scholar at our lab, and past president of Market Technicians Association with over 40 years of experience on Wall Street. Mike was exceptionally supportive of my interest in technical analysis, and introduced me to a number of its most influential practitioners. Chapter 5 of this thesis owes very much to Mike. I am also particularly thankful to Professor Jun Pan, for her collaboration on some extensions of the results in Chapter 2.

I would like to express my sincere gratitude to Professors Munther Dahleh and Paul Gray, for serving on my thesis committee, and for their kindness and advice. I am grateful to Marilyn Pierce and Svetlana Sussman for their invaluable and ever-present support and counsel. I thank Tom Brennan, Mila Getmansky Sherman, Katy Kaminski, and Dmitry Repin for inspiring discussions, and my LFE officemates for a stimulating environment.

I remain deeply indebted to my undergraduate advisor, Professor Narendra, for providing me with the right foundation at the critical juncture of my education.

This thesis is dedicated to those who are closest to me, whose love and strength accompany me through my life: my mother Mefareta and my soulmate Emanuele.

This research was supported by the MIT Laboratory for Financial Engineering and the MIT Presidential Fellowship.

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Chapter 1

Introduction

In this thesis we use nonlinear and linear estimation techniques to model two common investment strategies: *hedge funds* and *technical analysis*. Our models provide transparent and low-cost alternatives to these two nontransparent, and in some cases prohibitively costly, financial approaches. Moreover, given the highly controversial nature of technical analysis and the lack of academic scrutiny that this commonplace discipline has received, we undertake a broad study of its practices, encompassing not only implementation and empirical validation, but also a historical overview of its origins and interviews with its leading practitioners.

1.1 Hedge Funds

We start our thesis with a study of hedge funds. Just like more traditional investment vehicles, such as mutual funds, hedge funds, also known as alternative assets, are companies that pool the investors' money and manage that money professionally with the objective of making it grow. However, hedge funds distinguish themselves from traditional investments in several ways. On a positive note, they have the ability to generate much higher returns; thanks to their aggressive trading strategies and highly unregulated nature, hedge funds are able to expose themselves to complex and unique risks that are not accessible to traditional investment vehicles, and as a compensation for bearing such risk exposures they obtain rewards, known as risk premia, that complement those provided by traditional stock and bond investments. In addition to their superior returns, it is this ability of hedge funds to generate complementary sources of risk premia that makes them particularly attractive to investors; by holding a combination of traditional and alternative assets, investors are able to diversify and thereby reduce the risk of their overall portfolios. On a negative note, hedge funds are open to qualified investors only, the minimum investment typically being one million dollars or more. They are also notoriously secretive about their operations and holdings, an undesirable feature for regulated institutional investors, such as the pension funds.

Given these positive and negative aspects of hedge-fund investments, it is natural to ask whether hedge-fund-like returns can be replicated using easily implementable investment

strategies. In this chapter we examine such a possibility.

Although other authors have addressed the hedge-fund replication problem (Kat and Palaro 2005, 2006a,b; Bertsimas, Kogan, and Lo, 2001), their models are based on complex dynamic trading strategies which are impractical for a typical institutional investor. In contrast, in our work we propose a model that is easy to implement, requiring relatively little trading and no "active" management. In particular, we create passive replicating portfolios or "clones" using exchange-traded instruments that provide similar risk exposures and diversification benefits as hedge funds, but at lower cost and with greater transparency. Specifically, using monthly returns data for 1,610 hedge funds in the TASS database from 1986 to 2005, we estimate linear factor models for individual hedge funds using six common factors, and measure the proportion of the funds' expected returns and volatility that are attributable to such factors. For certain hedge-fund style categories, we find that a significant fraction of both can be captured by common factors corresponding to liquid exchange-traded instruments. While the performance of linear clones is generally inferior to their hedge-fund counterparts, in some cases the clones perform well enough to warrant serious consideration as passive, transparent, and low-cost alternatives to hedge funds. Although talented hedge-fund managers are always likely to outperform passive buy-and-hold portfolios, the challenges of manager selection and monitoring, the lack of transparency, and the high fees may tip the scales for the institutional investor in favor of clone portfolios.

1.2 Technical Analysis

Technical analysis is a visual study of past prices, primarily through the use of charts, for the purposes of forecasting future price moves. Technical analysts believe that when prices are plotted on a chart as a function of time, certain patterns that have predictive power can be observed. For example, the so-called head-and-shoulders pattern – a formation consisting of three peaks, the middle (head) being higher than the other two (shoulders) – is believed to indicate that prices are about to fall. It is contended that such patterns are driven by mass psychology, investors' fear and greed, and the forces of supply and demand in the market.

However, visual pattern recognition is a highly subjective endeavor. As a result, technical analysis suffers from a lack of standardization so pronounced that this discipline is considered part art part science. Given these shortcomings it is not hard to imagine that technical analysis, a commonplace practice among industry professionals, is a forbidden topic among finance academics.

In our work we try to reconcile this gap between the academic world and the industry practices by studying technical analysis from three different perspectives in Chapters 3, 4, and 5 of our thesis.

1.2.1 Automating Technical Analysis

First, in an attempt to remove the "art" out of technical analysis, in Chapter 3 we propose an algorithm that aims to formalize and automate the highly subjective and controversial

practice of detecting, with the naked eye, the geometric patterns that appear on price charts and that are believed to have predictive value. We start by recognizing that the evolution of prices over time is not random, but that it contains certain regularities or patterns, and we then attempt to identify, or extract, these patterns from the nonlinear time series of prices. Here it is important to realize that identifying patterns from the raw price data directly would not be sensible. When professional technicians study a price chart, their eyes naturally smooth the data, while their cognition discerns regularities. Moreover, many would argue that much of this process takes place on an intuitive and subconscious level, making it even harder to quantify. Hence, natural candidates for modelling the process by which technicians look for patterns in a price chart are pattern-recognition techniques known as smoothing estimators, which estimate nonlinear relationships by averaging the data in sophisticated ways to reduce the observational errors.

This problem has been previously studied by Lo, Mamaysky, and Wang (2000), who automate technical analysis using a smoothing estimator known as kernel regression. In our work, we revisit their algorithm and develop an analogous one based on neural networks. We argue that, given the flexibility of neural network models and the extent of parallel processing that they allow, our algorithm is a step forward in the automation of technical analysis. In an attempt to answer the question of whether or not technical analysis "works," we apply our algorithm to four years of daily data for twenty-five randomly selected Nasdaq stocks. We then evaluate the predictive ability of the detected patterns by comparing the unconditional empirical distribution of returns with the corresponding conditional, or post-pattern, empirical distribution; if technical patterns are informative, then unconditional and conditional distributions should not be close. We find that several technical patterns do provide incremental information; moreover, this conclusion appears to remain valid across different levels of smoothing and insensitive to the nuances of pattern definitions present in the technical analysis literature. Just as in the case of hedge funds, we conclude that although there will probably always be demand for talented technical analysts, the benefits of transparency and low cost associated with its automation suggest that algorithms such as ours should play some role in an investor's portfolio, and also have the potential of raising technical analysis to equal footing with other forms of financial analysis.

1.2.2 A Brief History of Technical Analysis

In Chapter 4 we approach technical analysis from a historical perspective, focusing on the origins of trading and speculation in general, and technical analysis in particular. Spanning several civilizations – from the most ancient to the modern ones – and several continents, our exposition highlights the universal nature of these activities, revealing them as a powerful and continuous driving forces of progress in human endeavor.

Since technical analysis has its roots in trading and speculation, a historical study of the former should be paralleled by a historical study of the latter. With this in mind, we start with a brief overview of the main trends in the Ancient Near Eastern trade from the Stone Age to the Iron Age, then summarize the evolution of the market economy of the Ancient Mediterranean form its birth in the Iron Age to its climax in the Roman Empire.

It is in the great centers of these ancient civilizations that the first instances of speculative trading and technical analysis came into being, the earliest known examples being the speculation in the Ancient Babylon and the second century A.D. Bourse of Rome. As we continue our investigation through the Middle Ages and the Renaissance, we arrive to 1634, the time when tulip mania – the (in)famous market bubble fuelled by the speculation in tulip bulbs – was sweeping through Holland. By the second half of the 17th century speculative trading had grown to a "strikingly modern stage of expertness," dramatic descriptions of which can be found in Joseph de la Vega's 1687 book entitled *Confusion de Confusiones* [7, p. 78].

In the 18th and the 19th centuries, with the Industrial Revolution sweeping through Europe, and the accompanying advancements in technology, transport, and communications, the market became worldwide [9, p. 53]. During this period Adam Smith came forth with his influential *The Wealth of Nations*, promoting movement towards greater commercial freedom and encouraging the competitive spirit to thrive. It was precisely this "substitution of competition for the medieval regulations" that Arnold Toynbee called the "essence" of the Industrial Revolution[1] [108, p. 11].

The rise of Wall Street as a financial center of the world during the early 20th century provided an ideal environment for the flourishing of technical analysis. In fact, the mainstream technical analysis, as it is known today in the western world, originated in the early 1900's, in the writings of the Wall Street veteran Charles H. Dow, who is commonly referred to as the grandfather of technical analysis. Among those who have formalized and extended the Dow Theory, or otherwise significantly contributed to the field of technical analysis, several individuals stand out: Samuel Armstrong Nelson, William Peter Hamilton, Robert Rhea, Richard Russell, C.J. Collins, Samuel Moment, Ralph Nelson Elliott, Richard W. Schabacker, Harold M. Gartley, and Richard C. Wyckoff. We study the influence of both C. H. Dow and his successors on the evolution of technical analysis.

We next turn to China, where markets can be traced back to the *Commentaries* of the *Book of Changes*,[2] and we review Chinese trade and finance from Ancient China to the 20th century. Clear similarities between Chinese commercial practices and present-day technical analysis surface during the late imperial period (1550-1930), when a well-defined merchant culture began to emerge, founded on the belief that the market "was not a mysterious force beyond control," but one that could be "understood, mastered, and manipulated" [75, p. 137].

Finally, we review a somewhat different brand of Japanese technical analysis, the emergence of which is closely linked to the establishment of the Dojima Rice Exchange in the 17th century and the wisdom of the great Japanese speculator named Munehisa Homma. The Eastern and the Western brand of technical analysis are compared and contrasted in the concluding portion of the historical overview.

The earliest technical analysis was in the form of financial astrology. For instance, par-

[1]Arnold Toynbee formulated this classic statement of the Industrial Revolution in a series of lectures given in 1880-1881, which remain influential to this day.

[2]The *Book of Changes* originated thousands of years ago in Ancient China, and it may be considered the oldest book in the world.

allels between the ancient Babylonian astronomical diaries and the contemporary technical analysis are evident. Another example is found in the oldest surviving Italian medieval commercial reference work entitled *Memoria de tucte le mercantile* (1278), which reveals that merchants might have made their purchasing decisions based on the astrological forecasts of the future supply, demand, and price of various commodities. To this date financial astrology remains a significant market factor, and although its inclusion in technical analysis is controversial, we do review its past and present status, for completeness.

1.2.3 Technical Analysis from the Horse's Mouth

Given the highly heterogeneous and unstandardized nature of current practice of technical analysis, learning "from the horse's mouth" is a necessary step towards gaining an understanding of this craft. To this end, we conduct in-depth interviews – lasting three hours on average – with a highly heterogeneous mix of fourteen leading practitioners of technical analysis, consisting of:

Successful Traders:	Linda Raschke, Stan Weinstein
Educators:	John Murphy, Ralph Acampora
Long-Term Investors:	Paul Desmond, Walter Deemer, Anthony Tabell
Artist Technicians:	Ian McAvity
Highly Automated Technicians:	Ned Davis
Highly Eclectic Technicians:	Gail Dudack
Market Historians:	Alan Shaw, Laszlo Birinyi
Long-Term Market Theme Writers:	Robert Farrell
Socio-Economics Technicians:	Robert Prechter.

Eleven of these interviews are conducted in person, two over the phone, and one via email, each with a transcript edited by its corresponding subject. Broadly speaking, participants are asked to comment on their early experiences and personal style of technical analysis, favorite patterns and indicators, evolution of technical analysis, their innovative process, emotional aspects of the craft, the role of creativity, the supernatural aspects of technical analysis, their level of conviction, their lifestyle, and the key to their success. We present these interviews in Chapter 5 of our thesis.

Chapter 2

Can Hedge-Fund Returns Be Replicated?: The Linear Case

2.1 Introduction

As institutional investors take a more active interest in alternative investments, a significant gap has emerged between the culture and expectations of those investors and hedge-fund managers. Pension plan sponsors typically require transparency from their managers and impose a number of restrictions in their investment mandates because of regulatory requirements such as ERISA rules; hedge-fund managers rarely provide position-level transparency and bristle at any restrictions on their investment process because restrictions often hurt performance. Plan sponsors require a certain degree of liquidity in their assets to meet their pension obligations, and also desire significant capacity because of their limited resources in managing large pools of assets; hedge-fund managers routinely impose lock-ups of one to three years, and the most successful managers have the least capacity to offer, in many cases returning investors' capital once they make their personal fortunes. And as fiduciaries, plan sponsors are hypersensitive to the outsize fees that hedge funds charge, and are concerned about misaligned incentives induced by performance fees; hedge-fund managers argue that their fees are fair compensation for their unique investment acumen, and at least for now, the market seems to agree.

This cultural gap raises the natural question of whether it is possible to obtain hedge-fund-like returns without investing in hedge funds. In short, can hedge-fund returns be "cloned"?

In this paper, we provide one answer to this challenge by constructing "linear clones" of individual hedge funds in the TASS Hedge Fund Database. These are passive portfolios of common risk factors like the S&P 500 and the U.S. Dollar Indexes, with portfolio weights estimated by regressing individual hedge-fund returns on the risk factors. If a hedge fund generates part of its expected return and risk profile from certain common risk factors, then it may be possible to design a low-cost passive portfolio—not an active dynamic trading strategy—that captures some of that fund's risk/reward characteristics by taking on just

those risk exposures. For example, if a particular long/short equity hedge fund is 40% long growth stocks, it may be possible to create a passive portfolio that has similar characteristics, e.g., a long-only position in a passive growth portfolio coupled with a 60% short position in stock-index futures.

The magnitude of hedge-fund alpha that can be captured by a linear clone depends, of course, on how much of a fund's expected return is driven by common risk factors versus manager-specific alpha. This can be measured empirically. While portable alpha strategies have become fashionable lately among institutions, our research suggests that for certain classes of hedge-fund strategies, portable beta may be an even more important source of untapped expected returns and diversification. In particular, in contrast to previous studies employing more complex factor-based models of hedge-fund returns, we use six factors that correspond to basic sources of risk and, consequently, of expected return: the stock market, the bond market, currencies, commodities, credit, and volatility. These factors are also chosen because, with the exception of volatility, each of them is tradable via liquid exchange-traded securities such as futures or forward contracts.

Using standard regression analysis we decompose the expected returns of a sample of 1,610 individual hedge funds from the TASS Hedge Fund Live Database into factor-based risk premia and manager-specific alpha, and we find that for certain hedge-fund style categories, a significant fraction of the funds' expected returns are due to risk premia. For example, in the category of Convertible Arbitrage funds, the average percentage contribution of the U.S. Dollar Index risk premium, averaged across all funds in this category, is 67%. While estimates of manager-specific alpha are also quite significant in most cases, these results suggest that at least a portion of a hedge fund's expected return can be obtained by bearing factor risks.

To explore this possibility, we construct linear clones using five of the six factors (we omit volatility because the market for volatility swaps and futures is still developing), and compare their performance to the original funds. For certain categories such as Equity Market Neutral, Global Macro, Long/Short Equity Hedge, Managed Futures, Multi-Strategy, and Fund of Funds, linear clones have comparable performance to their fund counterparts, but for other categories such as Event Driven and Emerging Markets, clones do not perform nearly as well. However, in all cases, linear clones are more liquid (as measured by their serial correlation coefficients), more transparent and scalable (by construction), and with correlations to a broad array of market indexes that are similar to those of the hedge funds on which they are based. For these reasons, we conclude that hedge-fund replication, at least for certain types of funds, is both possible and, in some cases, worthy of serious consideration.

We begin in Section 2.2 with a brief review of the literature on hedge-fund replication, and provide two examples that motivate this endeavor. In Section 2.3 we present a linear regression analysis of hedge-fund returns from the TASS Hedge Fund Live Database, with which we decompose the funds' expected returns into risk premia and manager-specific alpha. These results suggest that for certain hedge-fund styles, linear clones may yield reasonably compelling investment performance, and we explore this possibility directly in Section 2.4. We conclude in Section 2.5.

2.2 Motivation

In a series of recent papers, Kat and Palaro (2005, 2006a,b) argue that sophisticated dynamic trading strategies involving liquid futures contracts can replicate many of the statistical properties of hedge-fund returns. More generally, Bertsimas, Kogan, and Lo (2001) have shown that securities with very general payoff functions (like hedge funds, or complex derivatives) can be synthetically replicated to an arbitrary degree of accuracy by dynamic trading strategies—called "epsilon-arbitrage" strategies—involving more liquid instruments. While these results are encouraging for the hedge-fund replication problem, the replicating strategies are quite involved and not easily implemented by the typical institutional investor. Indeed, some of the derivatives-based replication strategies may be more complex than the hedge-fund strategies they intend to replicate, defeating the very purpose of replication.[1]

The motivation for our study comes, instead, from Sharpe's (1992) asset-class factor models in which he proposes to decompose a mutual fund's return into two distinct components: asset-class factors such as large-cap stocks, growth stocks, and intermediate government bonds, which he interprets as "style", and an uncorrelated residual that he interprets as "selection". This approach was applied by Fung and Hsieh (1997a) to hedge funds, but where the factors were derived statistically from a principal components analysis of the covariance matrix of their sample of 409 hedge funds and CTAs. While such factors may yield high in-sample R^2's, they suffer from significant over-fitting bias and also lack economic interpretation, which is one of the primary motivations for Sharpe's (1992) decomposition. Several authors have estimated factor models for hedge funds using more easily interpretable factors such as fund characteristics and indexes (Schneeweis and Spurgin, 1998; Liang, 1999; Edwards and Caglayan, 2001; Capocci and Hubner, 2004; Hill, Mueller, and Balasubramanian, 2004), and the returns to certain options-based strategies and other basic portfolios (Fung and Hsieh, 2001, 2004; Agarwal and Naik 2000a,b, 2004).

However, the most direct application of Sharpe's (1992) analysis to hedge funds is by Ennis and Sebastian (2003). They provide a thorough style analysis of the HFR Fund of Funds index, and conclude that funds of funds are not market neutral and although they do exhibit some market-timing abilities, "...the performance of hedge funds has not been good enough to warrant their inclusion in balanced portfolios. The high cost of investing in funds of funds contributes to this result." (Ennis and Sebastian, 2003, p. 111). This conclusion is the starting point for our study of linear clones.

Before turning to our empirical analysis of individual hedge-fund returns, we provide two concrete examples that span the extremes of the hedge-fund replication problem. For one hedge-fund strategy, we show that replication can be accomplished easily, and for another strategy, we find replication to be almost impossible using linear models.

[1] Nevertheless, derivatives-based replication strategies may serve a different purpose that is not vitiated by complexity: risk attribution, with the ultimate objective of portfolio risk management. Even if an underlying hedge-fund strategy is simpler than its derivatives-based replication strategy, the replication strategy may still be useful in measuring the overall risk exposures of the hedge fund and designing a hedging policy for a portfolio of hedge-fund investments.

2.2.1 Capital Decimation Partners

The first example is a hypothetical strategy proposed by Lo (2001) called "Capital Decimation Partners" (CDP), which yields an enviable track record that many investors would associate with a successful hedge fund: a 43.1% annualized mean return and 20% annualized volatility, implying a Sharpe ratio of 2.15,[2] and with only 6 negative months over the 96-month simulation period from January 1992 to December 1999 (see Table 2.1). A closer inspection of this strategy's monthly returns in Table 2.2 yields few surprises for the seasoned hedge-fund investor—the most challenging period for CDP was the summer of 1998 during the LTCM crisis, when the strategy suffered losses of −18.3% and −16.2% in August and September, respectively. But those investors courageous enough to have maintained their CDP investment during this period were rewarded with returns of 27.0% in October and 22.8% in November. Overall, 1998 was the second-best year for CDP, with an annual return of 87.3%.

Capital Decimation Partners, L.P.
Performance Summary
January 1992 to December 1999

Statistic	S&P500	CDP
Monthly Mean	1.4%	3.6%
Monthly SD	3.6%	5.8%
Minimum Month	-8.9%	-18.3%
Maximum Month	14.0%	27.0%
Annual Sharpe Ratio	1.39	2.15
# Negative Months	36	6
Correlation to S&P 500	100%	61%
Return Since Inception	367%	2560%

Table 2.1: Performance summary of simulated short-put-option strategy consisting of short-selling out-of-the-money S&P 500 put options with strikes approximately 7% out of the money and with maturities less than or equal to 3 months.

So what is CDP's secret? The investment strategy summarized in Tables 2.1 and 2.2 involves shorting out-of-the-money S&P 500 (SPX) put options on each monthly expiration

[2]As a matter of convention, throughout this paper we define the Sharpe ratio as the ratio of the monthly average return to the monthly standard deviation, then annualized by multiplying by the square root of 12. In the original definition of the Sharpe ratio, the numerator is the *excess* return of the fund, in excess of the riskfree rate. Given the time variation in this rate over our sample period, we use the total return so as to allow readers to select their own benchmarks.

date for maturities less than or equal to three months, and with strikes approximately 7% out of the money. According to Lo (2001), the number of contracts sold each month is determined by the combination of: (1) CBOE margin requirements;[3] (2) an assumption that we are required to post 66% of the margin as collateral;[4] and (3) $10M of initial risk capital. The essence of this strategy is the provision of insurance. CDP investors receive option premia for each option contract sold short, and as long as the option contracts expire out of the money, no payments are necessary. Therefore, the only time CDP experiences losses is when its put options are in the money, i.e., when the S&P 500 declines by more than 7% during the life of a given option. From this perspective, the handsome returns to CDP investors seem more justifiable—in exchange for providing downside protection, CDP investors are paid a risk premium in the same way that insurance companies receive regular payments for providing earthquake or hurricane insurance. Given the relatively infrequent nature of 7% losses, CDP's risk/reward profile can seem very attractive in comparison to more traditional investments, but there is nothing unusual or unique about CDP. Investors willing to take on "tail risk"—the risk of rare but severe events—will be paid well for this service (consider how much individuals are willing to pay each month for their homeowner's, auto, health, and life insurance policies). CDP involves few proprietary elements, and can be implemented by most investors, hence this is one example of a hedge-fund-like strategy that can easily be cloned.

[3]The margin required per contract is assumed to be:

$$100 \times \{15\% \times (\text{current level of the SPX}) - (\text{put premium}) - (\text{amount out of the money})\}$$

where the amount out of the money is equal to the current level of the SPX minus the strike price of the put.

[4]This figure varies from broker to broker, and is meant to be a rather conservative estimate that might apply to a $10M startup hedge fund with no prior track record.

Capital Decimation Partners, LP

Monthly Performance History, January 1992 to December 1999

Month	1992		1993		1994		1995		1996		1997		1998		1999	
	SPX	CDP	SPX	CDP	SPX	CDP	SPX	CDP	SPX	CDP	SPX	CDP	SPX	CDP	SPX	CDP
Jan	8.2	8.1	-1.2	1.8	1.8	2.3	1.3	3.7	-0.7	1.0	3.6	4.4	1.6	15.3	5.5	10.1
Feb	-1.8	4.8	-0.4	1.0	-1.5	0.7	3.9	0.7	5.9	1.2	3.3	6.0	7.6	11.7	-0.3	16.6
Mar	0.0	2.3	3.7	3.6	0.7	2.2	2.7	1.9	-1.0	0.6	-2.2	3.0	6.3	6.7	4.8	10.0
Apr	1.2	3.4	-0.3	1.6	-5.3	-0.1	2.6	2.4	0.6	3.0	-2.3	2.8	2.1	3.5	1.5	7.2
May	-1.4	1.4	-0.7	1.3	2.0	5.5	2.1	1.6	3.7	4.0	8.3	5.7	-1.2	5.8	0.9	7.2
Jun	-1.6	0.6	-0.5	1.7	0.8	1.5	5.0	1.8	-0.3	2.0	8.3	4.9	-0.7	3.9	0.9	8.6
Jul	3.0	2.0	0.5	1.9	-0.9	0.4	1.5	1.6	-4.2	0.3	1.8	5.5	7.8	7.5	5.7	6.1
Aug	-0.2	1.8	2.3	1.4	2.1	2.9	1.0	1.2	4.1	3.2	-1.6	2.6	-8.9	-18.3	-5.8	-3.1
Sep	1.9	2.1	0.6	0.8	1.6	0.8	4.3	1.3	3.3	3.4	5.5	11.5	-5.7	-16.2	-0.1	8.3
Oct	-2.6	-3.0	2.3	3.0	-1.3	0.9	0.3	1.1	3.5	2.2	-0.7	5.6	3.6	27.0	-6.6	-10.7
Nov	3.6	8.5	-1.5	0.6	-0.7	2.7	2.6	1.4	3.8	3.0	2.0	4.6	10.1	22.8	14.0	14.5
Dec	3.4	1.3	0.8	2.9	-0.6	10.0	2.7	1.5	1.5	2.0	-1.7	6.7	1.3	4.3	-0.1	2.4
Year	14.0	38.2	5.7	23.7	-1.6	33.6	34.3	22.1	21.5	28.9	26.4	84.8	24.5	87.3	20.6	105.7

Table 2.2: Monthly returns of simulated short-put-option strategy consisting of shortselling out-of-the-money S&P 500 put options with strikes approximately 7% out of the money and with maturities less than or equal to 3 months.

2.2.2 Capital Multiplication Partners

Consider now the case of "Capital Multiplication Partners" (CMP), a hypothetical fund based on a dynamic asset-allocation strategy between the S&P 500 and one-month U.S. Treasury Bills, where the fund manager can correctly forecast which of the two assets will do better in each month and invests the fund's assets in the higher-yielding asset at the start of the month.[5] Therefore, the monthly return of this perfect market-timing strategy is simply the larger of the monthly return of the S&P 500 and T-Bills. The source of this strategy's alpha is clear: Merton (1981) observes that perfect market-timing is equivalent to a long-only investment in the S&P 500 plus a put option on the S&P 500 with a strike price equal to the T-Bill return. Therefore, the economic value of perfect market-timing is equal to the sum of monthly put-option premia over the life of the strategy. And there is little doubt that such a strategy contains significant alpha: a $1 investment in CMP in January 1926 grows to $23,143,205,448 by December 2004! Table 2.3 provides a more detailed performance summary of CMP which confirms its remarkable characteristics—CMP's Sharpe ratio of 2.50 exceeds that of Warren Buffett's Berkshire Hathaway, arguably the most successful pooled investment vehicle of all time![6]

Capital Multiplication Partners, L.P. and Clone
Performance Summary
January 1926 to December 2004

Statistic	S&P 500	T-Bills	CMP	Clone
Monthly Mean	1.0%	0.3%	2.6%	0.7%
Monthly SD	5.5%	0.3%	3.6%	3.0%
Minimum Month	-29.7%	-0.1%	-0.1%	-16.3%
Maximum Month	42.6%	1.4%	42.6%	23.4%
Annual Sharpe Ratio	0.63	4.12	2.50	0.79
# Negative Months	360	12	10	340
Correlation to S&P 500	100%	-2%	84%	100%
Growth of $1 Since Inception	$3,098	$18	$2.3 x 10^{10}	$429

Table 2.3: Performance summary of simulated monthly perfect market-timing strategy between the S&P 500 and one-month U.S. Treasury Bills, and a passive linear clone, from January 1926 to December 2004.

[5]This example was first proposed by Bob Merton in his 15.415 Finance Theory class at the MIT Sloan School of Management.

[6]During the period from November 1976 to December 2004, the annualized mean and standard deviation of Berkshire Hathaway's Series A shares were 29.0% and 26.1%, respectively, for a Sharpe ratio of 1.12 using 0% for the risk-free benchmark return.

It should be obvious to even the most naive investor that CMP is a fantasy because no one can time the market perfectly. Therefore, attempting to replicate such a strategy with exchange-traded instruments seems hopeless. But suppose we try to replicate it anyway—how close can we come? In particular, suppose we attempt to relate CMP's monthly returns to the monthly returns of the S&P 500 by fitting a simple linear regression (see Figure 2-1). The option-like nature of CMP's perfect market-timing strategy is apparent in Figure 2-1's scatter of points, and visually, it is obvious that the linear regression does not capture the essence of this inherently nonlinear strategy. However, the formal measure of how well the linear regression fits the data, the "$\overline{R}^2$", is 70.3% in this case, which suggests a very strong linear relationship indeed. But when the estimated linear regression is used to construct a fixed portfolio of the S&P 500 and one-month T-Bills, the results are not nearly as attractive as CMP's returns, as Table 2.3 shows.

This example underscores the difficulty in replicating certain strategies with genuine alpha using linear clones, and cautions against using the $\overline{R}^2$ as the only metric of success. Despite the high $\overline{R}^2$ achieved by the linear regression of CMP's returns on the market index, the actual performance of the linear clone falls far short of the strategy because a linear model will never be able to capture the option-like payoff structure of the perfect market-timer.

2.3 Linear Regression Analysis

To explore the full range of possibilities for replicating hedge-fund returns illustrated by the two extremes of CDP and CMP, we investigate the characteristics of a sample of individual hedge funds drawn from the TASS Hedge Fund Database. The database is divided into two parts: "Live" and "Graveyard" funds. Hedge funds that are in the "Live" database are considered to be active as of the end of our sample period, September 2005.[7] We confine our attention to funds in the Live database since we wish to focus on the most current set of risk exposures in the hedge-fund industry, and we acknowledge that the Live database suffers from survivorship bias.[8]

[7]Once a hedge fund decides not to report its performance, is liquidated, is closed to new investment, restructured, or merged with other hedge funds, the fund is transferred into the "Graveyard" database. A hedge fund can only be listed in the "Graveyard" database after being listed in the "Live" database. Because the TASS database fully represents returns and asset information for live and dead funds, the effects of suvivorship bias are minimized. However, the database is subject to *backfill bias*—when a fund decides to be included in the database, TASS adds the fund to the "Live" database and includes all available prior performance of the fund. Hedge funds do not need to meet any specific requirements to be included in the TASS database. Due to reporting delays and time lags in contacting hedge funds, some Graveyard funds can be incorrectly listed in the Live database for a period of time. However, TASS has adopted a policy of transferring funds from the Live to the Graveyard database if they do not report over an 8- to 10-month period.

[8] For studies attempting to quantify the degree and impact of survivorship bias, see Baquero, Horst, and Verbeek (2004), Brown, Goetzmann, Ibbotson, and Ross (1992), Brown, Goetzmann, and Ibbotson (1999), Brown, Goetzmann, and Park (1997), Carpenter and Lynch (1999), Fung and Hsieh (1997b, 2000), Hendricks, Patel, and Zeckhauser (1997), Horst, Nijman, and Verbeek (2001), Liang (2000), and Schneeweis and Spurgin (1996).

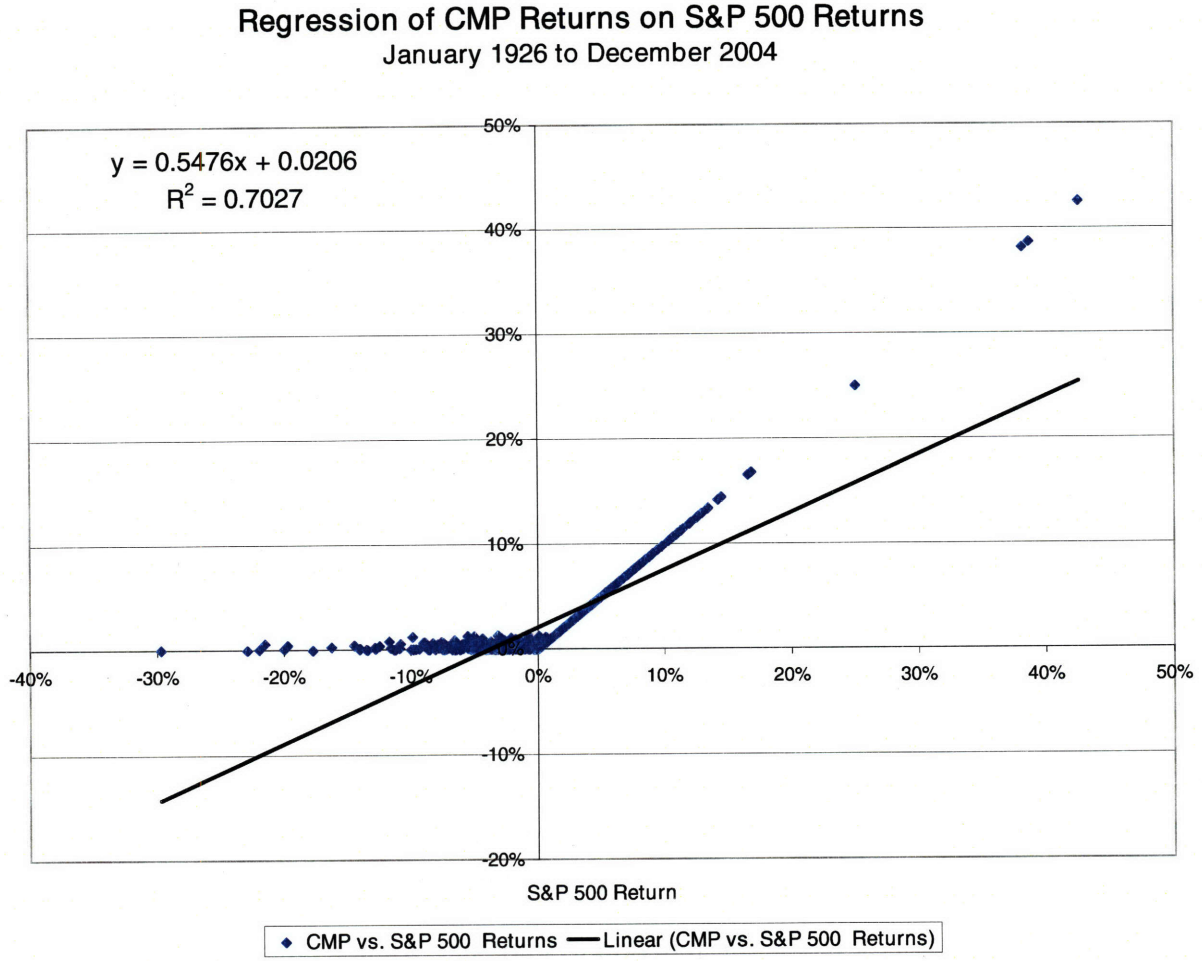

Figure 2-1: Scatter plot of simulated monthly returns of a perfect market-timing strategy between the S&P 500 and one-month U.S. Treasury Bills, against monthly returns of the S&P 500, from January 1926 to December 2004.

However, the importance of such a bias for our application is tempered by two considerations. First, many successful funds leave the sample as well as the poor performers, reducing the upward bias in expected returns. In particular, Fung and Hsieh (2000) estimate the magnitude of survivorship bias to be 3.00% per year, and Liang's (2000) estimate is 2.24% per year. Second, the focus of our study is on the *relative* performance of hedge funds versus relatively passive portfolios of liquid securities, and as long as our cloning process is not selectively applied to a peculiar subset of funds in the TASS database, any survivorship bias should impact both funds and clones identically, leaving their relative performance unaffected.

Of course, other biases plague the TASS database such as backfill bias (including funds with return histories that start before the date of inclusion), selection bias (inclusion in the database is voluntary, hence only funds seeking new investors are included),[9] and other potential biases imparted by the process by which TASS decides which funds to include and which to omit (part of this process is qualitative). As with survivorship bias, the hope is that the impact of these additional biases will be similar for clones and funds, leaving relative comparisons unaffected. Unfortunately, there is little to be done about such biases other than to acknowledge their existence, and to interpret the outcome of our empirical analysis with an extra measure of caution.

Although the TASS Hedge Fund Live database starts in February 1977, we limit our analysis to the sample period from February 1986 to September 2005 because this is the timespan for which we have complete data for all of our risk factors. Of these funds, we drop those that: (*i*) do not report net-of-fee returns;[10] (*ii*) report returns in currencies other than the U.S. dollar;[11] (*iii*) report returns less frequently than monthly; (*iv*) do not provide assets under management or only provide estimates; and (*v*) have fewer than 36 monthly returns. These filters yield a final sample of 1,610 funds.

2.3.1 Summary Statistics

TASS classifies funds into one of 11 different investment styles, listed in Table 2.4 and described in the Appendix, of which 10 correspond exactly to the CSFB/Tremont sub-index definitions.[12] Table 2.4 also reports the number of funds in each category for our sample, as well as summary statistics for the individual funds and for the equal-weighted portfolio of funds in each of the categories. The category counts show that the funds are not evenly

[9]We are not aware of any studies focusing on this type of bias, but the impact of selection on statistical inference has been explored in some detail by several authors. See, for example, Leamer (1978) and the citations within.

[10]TASS defines returns as the change in net asset value during the month (assuming the reinvestment of any distributions on the reinvestment date used by the fund) divided by the net asset value at the beginning of the month, net of management fees, incentive fees, and other fund expenses. Therefore, these reported returns should approximate the returns realized by investors.

[11]TASS converts all foreign-currency denominated returns to U.S.-dollar returns using the appropriate exchange rates.

[12]This is no coincidence—TASS is owned by Tremont Capital Management, which created the CSFB/Tremont indexes in partnership with Credit Suisse First Boston.

distributed across investment styles, but are concentrated among five categories: Long/Short Equity Hedge (520), Fund of Funds (355), Event Driven (169), Managed Futures (114), and Emerging Markets (102). Together, these five categories account for 78% of the 1,610 funds in our sample. The performance summary statistics in Table 2.4 underscore the reason for the growing interest in hedge funds in recent years—double-digit cross-sectional average returns for most categories with average volatility lower than that of the S&P 500, implying average annualized Sharpe ratios ranging from a low of 0.25 for Dedicated Short Bias funds to a high of 2.70 for Convertible Arbitrage funds.

Category	Sample Size	Annualized Mean (%)		Annualized SD (%)		Annualized Sharpe Ratio		ρ_1 (%)		Ljung-Box p-Value (%)		Annualized Performance of Equal-Weighted Portfolio of Funds		
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean (%)	SD (%)	Sharpe
Convertible Arbitrage	82	8.41	5.11	6.20	5.28	2.70	5.84	42.2	17.3	11.0	22.2	11.07	5.36	2.07
Dedicated Short Bias	10	5.98	4.77	28.27	10.05	0.25	0.24	5.5	12.6	24.2	20.3	6.40	23.23	0.28
Emerging Markets	102	20.41	13.01	22.92	15.16	1.42	2.11	18.0	12.4	36.3	30.2	22.34	17.71	1.26
Equity Market Neutral	83	8.09	4.77	7.78	5.84	1.44	1.20	9.1	23.0	32.6	29.7	12.83	6.23	2.06
Event Driven	169	13.03	8.65	8.40	8.09	1.99	1.37	22.2	17.6	27.0	29.3	13.47	4.37	3.08
Fixed Income Arbitrage	62	9.50	4.54	6.56	4.41	2.05	1.48	22.1	17.6	35.9	35.2	10.48	3.58	2.93
Global Macro	54	11.38	6.16	11.93	6.10	1.07	0.58	5.8	12.2	43.1	32.5	14.91	8.64	1.73
Long/Short Equity Hedge	520	14.59	8.14	15.96	9.06	1.06	0.58	12.8	14.9	36.0	30.5	16.35	11.84	1.38
Managed Futures	114	13.64	9.35	21.46	12.07	0.67	0.39	2.5	10.2	40.1	31.5	15.96	19.24	0.83
Multi-Strategy	59	10.79	5.22	8.72	9.70	1.86	1.03	21.0	20.1	28.2	30.1	14.59	5.78	2.52
Fund of Funds	355	8.25	3.73	6.36	4.47	1.66	0.86	23.2	15.0	27.1	26.3	11.93	7.48	1.59

Table 2.4: Summary statistics for TASS Live hedge funds included in our sample from February 1986 to September 2005.

Another feature of the data highlighted by Table 2.4 is the large positive average return-autocorrelations for funds in Convertible Arbitrage (42.2%), Emerging Markets (18.0%), Event Driven (22.2%), Fixed Income Arbitrage (22.1%), Multi-Strategy (21.0%), and Fund of Funds (23.2%) categories. Lo (2001) and Getmansky, Lo, and Makarov (2004) have shown that such high serial correlation in hedge-fund returns is likely to be an indication of illiquidity exposure. There is, of course, nothing inappropriate about hedge funds taking on liquidity risk—indeed, this is a legitimate and often lucrative source of expected return—as long as investors are aware of such risks, and not misled by the siren call of attractive Sharpe ratios.[13] But illiquidity exposure is typically accompanied by capacity limits, and we shall return to this issue when we compare the properties of hedge funds to more liquid alternatives such as linear clones.

2.3.2 Factor Model Specification

To determine the explanatory power of common risk factors for hedge funds, we perform a time-series regression for each of the 1,610 hedge funds in our sample, regressing the hedge fund's monthly returns on the following six factors: (1) USD: the U.S. Dollar Index return; (2) BOND: the return on the Lehman Corporate AA Intermediate Bond Index; (3) CREDIT: the spread between the Lehman BAA Corporate Bond Index and the Lehman Treasury Index; (4) SP500: the S&P 500 total return; (5) CMDTY: the Goldman Sachs Commodity Index (GSCI) total return; and (6) DVIX: the first-difference of the end-of-month value of the CBOE Volatility Index (VIX). These six factors are selected for two reasons: They provide a reasonably broad cross-section of risk exposures for the typical hedge fund (stocks, bonds, currencies, commodities, credit, and volatility), and each of the factor returns can be realized through relatively liquid instruments so that the returns of linear clones may be achievable in practice. In particular, there are forward contracts for each of the component currencies of the U.S. Dollar index, and futures contracts for the stock and bond indexes and for the components of the commodity index. Futures contracts on the VIX index were introduced by the CBOE in March 2004 and are not as liquid as the other index futures, but the OTC market for variance and volatility swaps is growing rapidly.

The linear regression model provides a simple but useful decomposition of a hedge fund's return R_{it} into several components:

$$R_{it} = \alpha_i + \beta_{i1}\text{RiskFactor}_{1t} + \cdots + \beta_{iK}\text{RiskFactor}_{Kt} + \epsilon_{it} . \tag{2.1}$$

From this decomposition, we have the following characterization of the fund's expected return

[13] It is no coincidence that the categories with the highest degree of average positive serial correlation are also the categories with the highest average Sharpe ratios. Smooth return series will, by definition, have higher Sharpe ratios than more volatile return series with the same mean.

and variance:

$$\mathrm{E}[R_{it}] = \alpha_i + \beta_{i1}\mathrm{E}[\text{RiskFactor}_{1t}] + \cdots + \beta_{iK}\mathrm{E}[\text{RiskFactor}_{Kt}] \quad (2.2)$$

$$\mathrm{Var}[R_{it}] = \beta_{i1}^2\mathrm{Var}[\text{RiskFactor}_{1t}] + \cdots + \beta_{iK}^2\mathrm{Var}[\text{RiskFactor}_{Kt}] + \text{Covariances} + \mathrm{Var}[\epsilon_{it}] \quad (2.3)$$

where "Covariances" is the sum of all pairwise covariances between RiskFactor_{pt} and RiskFactor_{qt} weighted by the product of their respective beta coefficients $\beta_{ip}\beta_{iq}$.

This characterization implies that there are two distinct sources of a hedge fund's expected return: beta exposures β_{ik} multiplied by the risk premia associated with those exposures $\mathrm{E}[\text{RiskFactor}_{kt}]$, and manager-specific alpha α_i. By "manager-specific", we do not mean to imply that a hedge fund's unique source of alpha is without risk—we are simply distinguishing this source of expected return from those that have clearly identifiable risk factors associated with them. In particular, it may well be the case that α_i arises from risk factors other than the six we have proposed, and a more refined version of (2.1)—one that reflects the particular investment style of the manager—may yield a better-performing linear clone.

From (2.3) we see that a hedge fund's variance has three distinct sources: the variances of the risk factors multiplied by the squared beta coefficients, the variance of the residual ϵ_{it} (which may be related to the specific economic sources of α_i), and the weighted covariances among the factors. This decomposition highlights the fact that a hedge fund can have several sources of risk, each of which should yield some risk premium, i.e., risk-based alpha, otherwise investors would not be willing to bear such risk. By taking on exposure to multiple risk factors, a hedge fund can generate attractive expected returns from the investor's perspective (see, for example, Capital Decimation Partners in Section 2.2.1).[14]

2.3.3 Factor Exposures

Table 2.5 presents summary statistics for the beta coefficients or factor exposures in (2.1) estimated for each of the 1,610 hedge funds by ordinary least squares and grouped by category. In particular, for each category we report the minimum, median, mean, and maximum beta coefficient for each of the six factors[15] and the intercept, across all regressions in that category. For example, the block of entries with the title "Intercept" presents summary statistics for the intercepts from the individual hedge-fund regressions within each category,

[14]Litterman (2005) calls such risk exposures "exotic betas" and argues that "[t]he adjective 'exotic' distinguishes it from market beta, the only beta which deserves to get paid a risk premium". We disagree—there are several well-established economic models that illustrate the possibility of multiple sources of systematic risk, each of which commands a positive risk premium, e.g., Merton (1973) and Ross (1976). We believe that hedge funds are practical illustrations of these multi-factor models of expected returns.

[15]The six factors are: the S&P 500 total return, the Lehman Corporate AA Intermediate Bond Index return, the U.S. Dollar Index return, the spread between the Lehman U.S. Aggregate Long Credit BAA Bond Index and the Lehman Treasury Long Index, the first-difference of the CBOE Volatility Index (VIX), and the Goldman Sachs Commodity Index (GSCI) total return.

and the "Mean" column shows that the average manager-specific alpha is positive for all categories, ranging from 0.42% per month for Managed Futures funds to 1.41% per month for Emerging Markets funds. This suggests that managers in our sample are, on average, indeed contributing value above and beyond the risk premia associated with the six factors we have chosen in (2.1). We shall return to this important issue in Section 2.3.4.

The panel in Table 2.5 with the heading R_{sp500} provides summary statistics for the beta coefficients corresponding to the S&P 500 return factor, and the entries in the "Mean" column are broadly consistent with each of the category definitions. For example, funds in the Dedicated Short Bias category have an average S&P 500 beta of -0.88, which is consistent with their shortselling mandate. On the other hand, Equity Market Neutral funds have an average S&P 500 beta of 0.05, confirming their market neutral status. And Long/Short Equity Hedge funds, which are mandated to provide partially hedged equity-market exposure, have an average S&P 500 beta of 0.38.

Category	Sample Size	Statistic	Intercept					R_{sp500}					R_{lb}				
			Min	Med	Mean	Max	SD	Min	Med	Mean	Max	SD	Min	Med	Mean	Max	SD
Convertible Arbitrage	82	beta	-0.52	0.41	0.43	1.57	0.37	-0.63	-0.01	-0.02	0.45	0.15	-0.08	0.26	0.30	1.73	0.29
		t-stat	-1.56	2.12	4.55	83.10	11.35	-2.58	-0.14	0.06	7.65	1.53	-0.52	1.60	1.60	4.50	1.12
Dedicated Short Bias	10	beta	-0.04	0.77	0.67	1.13	0.38	-1.78	-1.01	-0.88	-0.11	0.50	-0.60	0.18	0.25	0.96	0.48
		t-stat	-0.12	0.73	0.91	1.83	0.66	-10.95	-3.29	-3.88	-0.48	2.72	-1.37	0.24	0.17	1.05	0.70
Emerging Markets	102	beta	-0.75	1.19	1.41	6.50	1.08	-0.41	0.31	0.43	3.30	0.52	-4.53	0.02	0.01	2.33	0.77
		t-stat	-1.03	1.83	2.74	44.67	4.57	-1.77	1.69	1.65	5.46	1.61	-2.17	0.09	0.22	3.71	1.09
Equity Market Neutral	83	beta	-0.61	0.59	0.59	2.42	0.41	-1.22	0.05	0.05	0.90	0.27	-1.16	0.05	0.02	0.82	0.33
		t-stat	-1.40	2.02	2.88	13.89	3.00	-4.86	0.75	0.65	4.16	1.98	-3.74	0.30	0.27	2.67	1.09
Event Driven	169	beta	-0.12	0.78	0.93	6.18	0.78	-0.35	0.08	0.13	1.17	0.22	-4.23	0.08	0.04	1.31	0.46
		t-stat	-0.69	3.38	3.88	21.54	2.89	-2.80	1.26	1.34	10.87	1.88	-2.31	0.40	0.42	3.21	1.08
Fixed Income Arbitrage	62	beta	0.00	0.52	0.58	2.03	0.42	-0.39	0.03	0.02	0.23	0.10	-0.55	0.20	0.27	1.86	0.40
		t-stat	0.00	2.85	3.85	24.30	3.91	-2.42	0.55	0.44	3.23	1.25	-2.63	1.00	1.26	11.02	1.99
Global Macro	54	beta	-0.79	0.63	0.59	1.75	0.54	-0.49	0.01	0.10	1.14	0.30	-0.74	0.21	0.34	2.03	0.56
		t-stat	-1.56	1.53	1.71	7.66	1.62	-2.97	0.19	0.59	6.16	1.84	-1.93	0.71	0.92	6.05	1.51
Long/Short Equity Hedge	520	beta	-1.53	0.84	0.89	7.60	0.75	-1.37	0.33	0.38	3.13	0.44	-3.04	-0.01	0.03	3.49	0.59
		t-stat	-1.80	1.84	1.86	10.47	1.38	-3.72	2.06	2.27	20.07	2.50	-3.47	-0.01	0.06	3.33	1.06
Managed Futures	114	beta	-1.84	0.48	0.42	3.69	0.73	-0.81	-0.01	0.03	2.30	0.37	-0.44	0.88	0.89	2.62	0.67
		t-stat	-2.36	0.72	0.65	4.98	1.08	-2.94	-0.05	0.20	7.88	1.43	-1.70	1.46	1.60	4.34	1.22
Multi-Strategy	59	beta	-0.41	0.71	0.71	2.68	0.47	-0.31	0.07	0.15	1.34	0.26	-1.81	0.10	0.12	2.40	0.51
		t-stat	-0.43	3.22	3.41	10.51	2.41	-2.22	1.27	1.37	5.98	1.68	-1.49	0.58	0.57	3.49	1.13
Fund of Funds	355	beta	-0.77	0.42	0.43	1.88	0.34	-0.80	0.09	0.12	0.85	0.15	-0.50	0.12	0.18	2.25	0.29
		t-stat	-3.55	2.34	2.67	10.51	2.14	-2.65	1.56	1.84	9.44	1.80	-1.59	0.83	0.95	4.84	1.17

Table 2.5: Summary statistics for multivariate linear regressions of monthly returns of hedge funds in the TASS Live database from February 1986 to September 2005 on the six factors.

Category	Sample Size	Statistic	R_{usd}					R_{cs}					ΔVIX				
			Min	Med	Mean	Max	SD	Min	Med	Mean	Max	SD	Min	Med	Mean	Max	SD
Convertible Arbitrage	82	**beta**	-0.98	0.01	-0.02	0.68	0.28	0.00	0.39	0.52	2.87	0.57	-0.25	0.05	0.05	0.32	0.08
		t-stat	-2.23	0.15	0.12	2.91	1.22	0.19	3.06	2.95	7.72	1.58	-1.41	0.50	0.66	3.56	0.98
Dedicated Short Bias	10	**beta**	-0.08	0.73	0.67	1.25	0.51	-0.98	-0.26	-0.19	0.93	0.67	-0.26	0.05	0.04	0.44	0.23
		t-stat	-0.19	1.26	1.07	1.99	0.77	-2.67	-0.68	-0.44	2.54	1.64	-1.11	0.24	0.23	2.56	1.10
Emerging Markets	102	**beta**	-4.66	-0.39	-0.42	2.18	0.79	-0.56	0.46	0.59	2.89	0.67	-1.41	-0.05	0.01	3.91	0.50
		t-stat	-3.74	-1.03	-0.97	2.53	1.20	-1.97	1.32	1.33	4.82	1.36	-3.95	-0.35	-0.28	3.88	1.17
Equity Market Neutral	83	**beta**	-2.83	0.02	-0.04	1.24	0.44	-1.78	-0.03	-0.06	0.72	0.31	-1.19	0.02	0.03	0.80	0.23
		t-stat	-4.17	0.08	0.16	3.65	1.39	-3.83	-0.27	-0.35	3.34	1.44	-3.10	0.22	0.25	3.95	1.23
Event Driven	169	**beta**	-6.38	-0.05	-0.13	1.46	0.60	-1.96	0.25	0.33	2.01	0.45	-1.81	0.02	0.05	1.19	0.26
		t-stat	-2.86	-0.31	-0.14	3.40	1.35	-1.66	1.51	1.81	8.31	1.99	-2.76	0.42	0.36	4.58	1.17
Fixed Income Arbitrage	62	**beta**	-0.66	0.05	0.07	0.77	0.35	-0.70	0.10	0.19	1.54	0.46	-0.71	0.05	0.07	0.50	0.18
		t-stat	-3.48	0.38	0.66	4.62	1.68	-3.29	0.80	1.25	11.74	2.56	-3.16	0.85	1.16	5.62	1.93
Global Macro	54	**beta**	-2.00	-0.23	-0.23	1.35	0.67	-0.61	0.13	0.18	1.73	0.42	-0.36	0.03	0.07	0.55	0.19
		t-stat	-6.51	-0.83	-0.73	4.52	1.95	-1.60	0.44	0.60	3.96	1.25	-3.08	0.33	0.34	3.61	1.11
Long/Short Equity Hedge	520	**beta**	-2.57	-0.03	-0.09	2.45	0.60	-1.37	0.17	0.28	4.55	0.59	-1.67	0.07	0.07	2.76	0.33
		t-stat	-4.60	-0.10	-0.19	3.41	1.18	-5.28	0.58	0.69	4.94	1.36	-4.70	0.46	0.38	3.67	1.28
Managed Futures	114	**beta**	-2.65	-0.37	-0.39	1.14	0.63	-5.98	-0.33	-0.35	3.20	0.82	-0.75	0.14	0.15	1.29	0.32
		t-stat	-4.25	-0.83	-0.72	1.99	0.98	-2.85	-0.92	-0.73	2.56	1.04	-2.81	0.73	0.74	4.36	1.28
Multi-Strategy	59	**beta**	-1.84	0.07	0.01	0.78	0.41	-0.48	0.07	0.17	1.64	0.41	-0.38	0.04	0.09	0.95	0.19
		t-stat	-2.78	0.36	0.39	3.19	1.34	-2.20	0.72	1.21	6.34	2.12	-1.59	0.68	0.87	3.72	1.31
Fund of Funds	355	**beta**	-1.12	-0.07	-0.10	0.62	0.24	-0.78	0.17	0.17	1.41	0.22	-0.32	0.06	0.07	0.48	0.09
		t-stat	-3.63	-0.53	-0.42	3.32	1.28	-3.62	1.38	1.53	6.35	1.55	-2.74	0.98	0.98	4.69	1.12

Table 2.5: (continued) Summary statistics for multivariate linear regressions of monthly returns of hedge funds in the TASS Live database from February 1986 to September 2005 on the six factors.

Category	Sample Size	Statistic	R_{gsci} Min	Med	Mean	Max	SD	Statistic	Significance (%) Min	Med	Mean	Max	SD
Convertible Arbitrage	82	beta	-0.07	0.01	0.02	0.16	0.03	Adj. R^2	-11.0	16.0	17.3	66.2	15.4
		t-stat	-1.15	0.52	0.51	2.17	0.69	p(F)	0.0	1.0	11.8	97.1	23.6
Dedicated Short Bias	10	beta	-0.38	-0.11	-0.12	0.06	0.13	Adj. R^2	-3.5	39.7	40.4	79.5	25.4
		t-stat	-2.19	-0.86	-0.95	0.54	0.92	p(F)	0.0	0.0	8.3	83.0	26.2
Emerging Markets	102	beta	-0.34	0.05	0.06	0.34	0.09	Adj. R^2	-4.7	17.4	19.4	54.7	14.3
		t-stat	-1.46	0.68	0.60	2.40	0.79	p(F)	0.0	0.2	8.4	78.8	17.7
Equity Market Neutral	83	beta	-0.12	0.01	0.02	0.38	0.07	Adj. R^2	-8.1	7.2	10.4	63.2	13.7
		t-stat	-2.05	0.48	0.43	2.80	1.11	p(F)	0.0	7.4	19.9	94.1	24.6
Event Driven	169	beta	-0.27	0.01	0.01	0.27	0.06	Adj. R^2	-7.5	15.5	19.5	68.5	16.4
		t-stat	-2.27	0.50	0.60	4.06	1.15	p(F)	0.0	0.3	11.1	88.6	20.0
Fixed Income Arbitrage	62	beta	-0.06	0.01	0.02	0.15	0.05	Adj. R^2	-8.9	12.8	14.9	78.9	15.9
		t-stat	-1.76	0.57	0.52	2.52	1.10	p(F)	0.0	2.1	17.7	94.6	26.3
Global Macro	54	beta	-0.09	0.02	0.04	0.27	0.08	Adj. R^2	-12.6	8.9	14.8	74.0	17.3
		t-stat	-1.22	0.37	0.60	3.92	1.20	p(F)	0.0	4.9	16.8	97.0	24.3
Long/Short Equity Hedge	520	beta	-0.33	0.04	0.06	0.88	0.11	Adj. R^2	-13.8	18.8	21.6	90.2	19.0
		t-stat	-3.31	0.74	0.77	5.91	1.13	p(F)	0.0	0.4	11.8	97.7	22.9
Managed Futures	114	beta	-0.31	0.11	0.13	0.80	0.15	Adj. R^2	-6.0	13.3	15.3	70.0	13.3
		t-stat	-2.15	1.32	1.36	5.25	1.22	p(F)	0.0	0.6	8.2	88.5	17.0
Multi-Strategy	59	beta	-0.05	0.03	0.04	0.75	0.11	Adj. R^2	-13.5	8.9	12.9	51.7	15.7
		t-stat	-1.34	0.87	0.81	2.90	0.97	p(F)	0.0	6.7	21.7	97.5	28.9
Fund of Funds	355	beta	-0.23	0.03	0.05	0.35	0.05	Adj. R^2	-7.2	20.4	22.3	72.3	14.9
		t-stat	-3.16	1.38	1.39	4.28	1.01	p(F)	0.0	0.2	5.7	84.0	14.3

Table 2.5: (continued) Summary statistics for multivariate linear regressions of monthly returns of hedge funds in the TASS Live database from February 1986 to September 2005 on the six factors.

The remaining panels in Table 2.5 show that risk exposures do vary considerably across categories. This is more easily seen in Figure 2-2 which plots the mean beta coefficients for all six factors, category by category. From Figure 2-2, we see that Convertible Arbitrage funds have three main exposures (long credit, long bonds, and long volatility), whereas Emerging Markets funds have four somewhat different exposures (long stocks, short USD, long credit, and long commodities). The category with the smallest overall risk exposures is Equity Market Neutral, and not surprisingly, this category exhibits the second lowest average mean return, 8.09%.

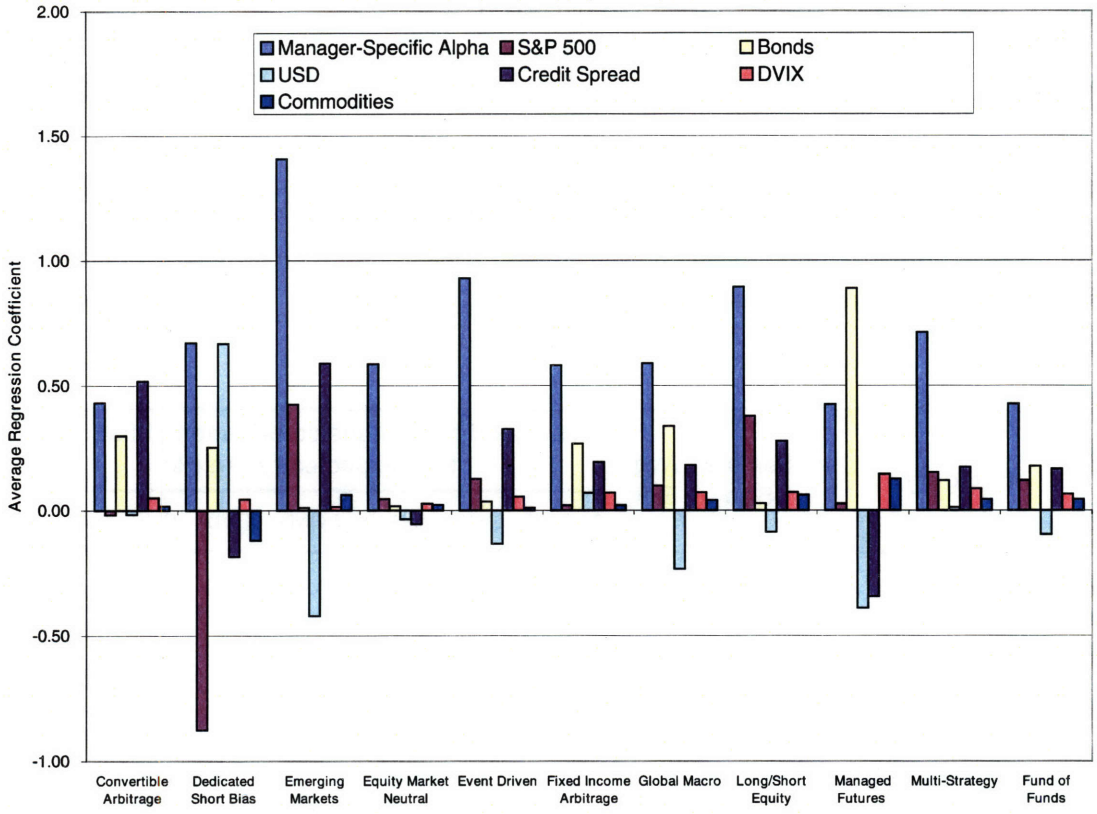

Figure 2-2: Average regression coefficients for multivariate linear regressions of monthly returns of hedge funds in the TASS Live database from February 1986 to September 2005 on six factors: the S&P 500 total return, the Lehman Corporate AA Intermediate Bond Index return, the U.S. Dollar Index return, the spread between the Lehman U.S. Aggregate Long Credit BAA Bond Index and the Lehman Treasury Long Index, the first-difference of the CBOE Volatility Index (VIX), and the Goldman Sachs Commodity Index (GSCI) total return.

The final panel of Table 2.5 contains a summary of the explanatory power of (2.1) as measured by the $\overline{R}^2$ statistic of the regression (2.1). The mean $\overline{R}^2$'s range from a low of 10.4% for Equity Market Neutral (as expected, given this category's small average factor exposures

to all six factors) to a high of 40.4% for Dedicated Short Bias (which is also expected given this category's large negative exposure to the S&P 500).

To provide further intuition for the relation between $\overline{R}^2$ and fund characteristics, we regress $\overline{R}^2$ on several fund characteristics, and find that lower $\overline{R}^2$ funds are those with higher Sharpe ratios, higher management fees, and higher incentive fees. This accords well with the intuition that funds providing greater diversification benefits, i.e., lower $\overline{R}^2$'s, command higher fees in equilibrium.

2.3.4 Expected-Return Decomposition

Using the parameter estimates of (2.1) for the individual hedge funds in our sample, we can now reformulate the question of whether or not a hedge-fund strategy can be cloned as a question about how much of a hedge fund's expected return is due to risk premia from identifiable factors. If it is a significant portion and the relationship is primarily linear, then a passive portfolio with just those risk exposures—created by means of liquid instruments such as index futures, forwards, and other marketable securities—may be a reasonable alternative to a less liquid and opaque investment in the fund.

Category	Sample Size	Avg. E[R]	Average of percentage contribution of factors to total expected return (%)						
			CREDIT	USD	SP500	BOND	DVIX	CMDTY	ALPHA
Convertible Arbitrage	82	8.4	27.1	67.1	-19.3	34.9	-8.4	31.8	-33.3
Dedicated Short Bias	10	6.0	12.2	19.4	-108.2	7.0	8.9	-64.9	225.6
Emerging Markets	102	20.4	-0.3	-3.2	19.3	0.1	-0.4	6.2	78.3
Equity Market Neutral	83	8.1	0.2	3.6	4.0	3.9	1.3	6.3	80.8
Event Driven	169	13.0	2.1	3.0	4.3	9.4	-0.7	3.1	79.0
Fixed Income Arbitrage	62	9.5	-1.4	3.3	2.7	18.5	-0.5	4.4	73.1
Global Macro	54	11.4	2.0	8.1	9.7	25.0	-3.3	10.0	48.6
Long/Short Equity Hedge	520	14.6	1.1	1.9	17.8	2.1	-1.8	8.4	70.5
Managed Futures	114	13.6	1.9	23.4	-3.4	53.8	-1.5	53.2	-27.5
Multi-Strategy	59	10.8	0.5	3.5	5.7	10.1	-1.9	3.2	78.9
Fund of Funds	355	8.3	0.5	5.4	9.7	8.8	-2.8	7.3	71.1
All Funds	1,610	11.3	2.3	7.8	8.5	11.3	-1.9	10.9	61.0

Table 2.6: Decomposition of total mean returns of hedge funds in the TASS Live database according to percentage contributions from six factors and manager-specific alpha, for 1,610 hedge funds from February 1986 to September 2005.

Table 2.6 summarizes the results of the expected-return decomposition (2.2) for our sample of 1,610 funds, grouped according to their style categories and for all funds. Each

row of Table 2.6 contains the average total mean return of funds in a given category and averages of the percent contributions of each of the six factors and the manager-specific alpha to that average total mean return.[16] Note that the average percentage contributions add up to 100% when summed across all six factors and the manager-specific alpha because this decomposition sums to 100% for each fund, and when this decomposition is averaged across all funds, the sum is preserved.

The first row's entries indicate that the most significant contributors to the average total mean return of 8.4% for Convertible Arbitrage funds are CREDIT (27.1%), USD (67.1%), BOND (34.9%), and CMDTY (31.8%), and the average contribution of manager-specific alpha is −33.3%. This implies that on average, Convertible Arbitrage funds earn more than all of their mean returns from the risk premia associated with the six factor exposures, and that the average contribution of other sources of alpha is negative! Of course, this does not mean that convertible-arbitrage managers are not adding value—Table 2.6's results are averages across all funds in our sample, hence the positive manager-specific alphas of successful managers will be dampened and, in some cases, outweighed by the negative manager-specific alphas of the unsuccessful ones.

In contrast to the Convertible Arbitrage funds, for the 10 funds in the Dedicated Short Bias category, the manager-specific alpha accounts for 225.6% of the funds' total mean return on average, and the contribution of the SP500 factor is negative. This result is not as anomalous as it seems. The bull market of the 1990's implies a performance drag for any fund with negative exposure to the S&P 500, therefore, Dedicated Short Bias managers that have generated positive performance during this period must have done so through other means. A concrete illustration of this intuition is given by the return decomposition of the annualized average return of the two most successful funds in the Dedicated Short Bias category, funds 33735 and 33736. These two funds posted annualized net-of-fee returns of 15.56% and 10.02%, respectively, but the contribution of the SP500 factor to these annualized returns was negative in both cases (both funds had negative SP500 beta exposures, as they should, and the S&P 500 yielded positive returns over the funds' lifetimes).[17]

Between the two extremes of Convertible Arbitrage and Dedicated Short Bias funds, Table 2.6 shows considerable variation in the importance of manager-specific alpha for the other categories. Over 80% of the average total return of Equity Market Neutral funds is due to manager-specific alpha, but for Managed Futures, the manager-specific alpha accounts for −27.5%. For the entire sample of 1,610 funds, 61% of the average total return is attributable to manager-specific alpha, implying that on average, the remaining 39% is due to the risk premia from our six factors. These results suggest that for certain types of hedge-fund strategies, a multi-factor portfolio may yield some of the same benefits but in a transparent, scalable, and lower-cost vehicle.

[16]Throughout this article, all statistics except for those related to the first-order autocorrelation have been annualized to facilitate interpretation and comparison.

[17]In fact, a decomposition of the total mean returns of these two shows that the six factors account for very little of the two funds' performance, hence the manager-specific alphas are particularly significant for these two managers.

2.4 Linear Clones

The multivariate regression results in Section 2.3 suggest that linear clones may be able to replicate some of the risk exposures of hedge funds, and in this section we investigate this possibility directly by considering two types of clones. The first type consists of "fixed-weight" portfolios, where we use the entire sample of a given fund's returns to estimate a set of portfolio weights for the instruments corresponding to the factors used in the linear regression. These portfolio weights are fixed through time for each fund, hence the term "fixed-weight". But because this approach involves a certain degree of "look-ahead" bias—we use the entire history of a fund's returns to construct the portfolio weights that are applied each period to compute the clone portfolio return—we also construct a second type of linear clone based on rolling-window regressions.

2.4.1 Fixed-Weight vs. Rolling-Window Clones

To construct a fixed-weight linear clone for fund i, we begin by regressing the fund's returns $\{R_{it}\}$ on five of the six factors we considered in Section 2.3 (we drop the DVIX factor because its returns are not as easily realized with liquid instruments), where we omit the intercept and constrain the beta coefficients to sum to one:

$$\begin{aligned} R_{it} &= \beta_{i1}\text{SP500}_t + \beta_{i2}\text{BOND}_t + \beta_{i3}\text{USD}_t + \\ &\quad \beta_{i4}\text{CREDIT}_t + \beta_{i5}\text{CMDTY}_t + \epsilon_{it} \ , \ t = 1, \ldots, T \qquad (2.4a) \\ \text{subject to } 1 &= \beta_{i1} + \cdots + \beta_{i5} \ . \qquad (2.4b) \end{aligned}$$

This is the same technique proposed by Sharpe (1992) for conducting "style analysis", however, our motivation is quite different. We omit the intercept because our objective is to estimate a weighted average of the factors that best replicates the fund's returns, and omitting the constant term forces the least-squares algorithm to use the factor means to fit the mean of the fund, an important feature of replicating hedge-fund expected returns with factor risk premia. And we constrain the beta coefficients to sum to one to yield a portfolio interpretation for the weights. Note that we do not constrain the regression coefficients to be non-negative as Sharpe (1992) does because unlike Sharpe's original application to long-only mutual funds, in our context all five factors correspond to instruments that can be shortsold, and we do expect to be shortselling each of these instruments on occasion to achieve the kind of risk exposures hedge funds typically exhibit. For example, clones of Dedicated Short Bias funds will undoubtedly require shorting the SP500 factor.

The estimated regression coefficients $\{\beta^*_{ik}\}$ are then used as portfolio weights for the five factors, hence the portfolio returns are equivalent to the fitted values R^*_{it} of the regression equation. However, we implement an additional renormalization so that the resulting

portfolio return $\widehat{R}_{it}$ has the same sample volatility as the original fund's return series:

$$R^*_{it} \equiv \beta^*_{i1}\text{SP500}_t + \beta^*_{i2}\text{BOND}_t + \beta^*_{i3}\text{USD}_t + \beta^*_{i4}\text{CREDIT}_t + \beta^*_{i5}\text{CMDTY}_t \quad (2.5)$$

$$\widehat{R}_{it} \equiv \gamma_i R^*_{it} \quad , \quad \gamma_i \equiv \frac{\sqrt{\sum_{t=1}^{T}(R_{it}-\overline{R}_i)^2/(T-1)}}{\sqrt{\sum_{t=1}^{T}(R^*_{it}-\overline{R}^*_i)^2/(T-1)}} \quad (2.6)$$

$$\overline{R}_i \equiv \frac{1}{T}\sum_{t=1}^{T} R_{it} \quad , \quad \overline{R}^*_i \equiv \frac{1}{T}\sum_{t=1}^{T} R^*_{it} \, . \quad (2.7)$$

The motivation for this renormalization is to create a fair comparison between the clone portfolio and the fund by equalizing their volatilities. Renormalizing (2.5) is equivalent to changing the leverage of the clone portfolio, since the sum of the renormalized betas $\gamma_i \sum_k \beta^*_{ik}$ will equal the renormalization factor γ_i, not one. If γ_i exceeds one, then positive leverage is required, and if less than one, the portfolio is not fully invested in the five factors. A more complete expression of the portfolio weights of clone i may be obtained by introducing an additional asset that represents leverage, i.e., borrowing and lending, in which case the portfolio weights of the five factors and this additional asset must sum to one:

$$1 = \gamma_i(\beta^*_{i1} + \cdots + \beta^*_{i5}) + \delta_i \, . \quad (2.8)$$

The clone return is then given by:

$$\widehat{R}_{it} = \gamma_i(\beta^*_{i1}\,\text{SP500}_t + \cdots + \beta^*_{i5}\,\text{CMDTY}_t) + \delta_i R_l \quad (2.9)$$

where R_l is the borrowing/lending rate. Since this rate depends on many factors such as the credit quality of the respective counterparties, the riskiness of the instruments and portfolio strategy, the size of the transaction, and general market conditions, we do not attempt to assume a particular value for R_l but simply point out its existence.[18]

As discussed above, fixed-weight linear clones are affected by look-ahead bias because the entire histories of fund and factor returns are used to construct the clones' portfolio weights and renormalization factors. To address this issue, we present an alternate method of constructing linear clones using a rolling window for estimating the regression coefficients

[18]However, it should be kept in mind that the futures and forward contracts corresponding to the five factors in (2.5) have sizable amounts of leverage built into the contracts themselves, so that for reasonable values of γ_i, we can re-write (2.9) as:

$$\widehat{R}_{it} = \beta^*_{i1}\,(\gamma_i\text{SP500}_t) + \cdots + \beta^*_{i5}\,(\gamma_i\text{CMDTY}_t) + \delta_i R_l \quad (2.10)$$

$$= \beta^*_{i1}\,\text{SP500}^*_t + \cdots + \beta^*_{i5}\,\text{CMDTY}^*_t \quad (2.11)$$

where we have redefined five new instruments in (2.11) that can achieve γ_i times the leverage of the original instruments in (2.9) at no additional cost. Since the coefficients $\{\beta^*_{ik}\}$ sum to one by construction, there is no need for any additional borrowing or lending because each redefined instrument is already leveraged by the factor γ_i, hence $\delta_i \equiv 0$ in (2.11).

and renormalization factors. Rolling-window estimators can also address the ubiquitous issue of nonstationarity that affects most financial time-series studies; time-varying means, volatilities, and general market conditions can be captured to some degree by using rolling windows.

To construct a "rolling-window" linear clone, for each month t, we use a 24-month rolling window from months $t-24$ to $t-1$ to estimate the same regression (2.4) as before:[19]

$$\begin{aligned} R_{it-k} &= \beta_{it1}\text{SP500}_{t-k} + \beta_{it2}\text{BOND}_{t-k} + \beta_{it3}\text{USD}_{t-k} + \\ &\quad \beta_{it4}\text{CREDIT}_{t-k} + \beta_{it5}\text{CMDTY}_{t-k} + \epsilon_{it-k} \ , \quad k = 1, \ldots, 24 \quad (2.12a) \\ \text{subject to } 1 &= \beta_{it1} + \cdots + \beta_{it5} \quad (2.12b) \end{aligned}$$

but now the coefficients are indexed by both i and t since we repeat this process each month for every fund i. The parameter estimates are then used in the same manner as in the fixed-weight case to construct clone returns $\widehat{R}_{it}$:

$$R^*_{it} \equiv \beta^*_{it1}\text{SP500}_t + \beta^*_{it2}\text{BOND}_t + \beta^*_{it3}\text{USD}_t + \beta^*_{it4}\text{CREDIT}_t + \beta^*_{it5}\text{CMDTY}_t \quad (2.13)$$

$$\widehat{R}_{it} \equiv \gamma_{it} R^*_{it} \ , \ \gamma_{it} \equiv \frac{\sqrt{\sum_{k=1}^{24}(R_{it-k} - \overline{R}_{it})^2/23}}{\sqrt{\sum_{k=1}^{24}(R^*_{it-k} - \overline{R}^*_{it})^2/23}} \quad (2.14)$$

$$\overline{R}_{it} \equiv \frac{1}{24}\sum_{k=1}^{24} R_{it-k} \ , \ \overline{R}^*_{it} \equiv \frac{1}{24}\sum_{k=1}^{24} R^*_{it-k} \quad (2.15)$$

where the renormalization factors γ_{it} are now indexed by time t to reflect the fact that they are also computed within the rolling window. This implies that for any given clone i, the volatility of its returns over the entire history will no longer be identical to the volatility of its matching fund because the renormalization process is applied only to rolling windows, not to the entire history of returns. However, as long as volatilities do not shift dramatically over time, the rolling-window renormalization process should yield clones with similar volatilities.

Although rolling-window clones may seem more practically relevant because they avoid the most obvious forms of look-ahead bias, they have drawbacks as well. For example, the rolling-window estimation procedure generates more frequent rebalancing needs for the clone portfolio, which is counter to the passive spirit of the cloning endeavor. Moreover, rolling-window estimators are typically subject to greater estimation error because of the smaller sample size. This implies that at least part of the rebalancing of rolling-window clones is unnecessary. The amount of rebalancing can, of course, be controlled by adjusting the length of the rolling window—a longer window implies more stable weights, but stability implies

[19]If there are missing observations within this 24-month window, we extend the window backwards in time until we obtain 24 datapoints for our regression. Our choice of 24 months for the rolling window was a compromise between the desire to capture nonstationarities in the data and the need for a sufficient number of observations to estimate the parameters of the clone. We did not try other window lengths because we wished to reduce the impact of "backtest bias" or over-fitting on our empirical results.

less flexibility in capturing potential nonstationarities in the data.

Ultimately, the choice between fixed-weight and rolling-window clones depends on the nature of the application, the time-series properties of the strategies being cloned, and the specific goals and constraints of the investor. A passive investor with little expertise in trading and risk management may well prefer the fixed-weight clone, whereas a more active investor with trading capabilities and a desire to implement dynamic asset-allocation policies will prefer the rolling-window clone. For these reasons, we present results for both types of clones in Sections 2.4.2–2.4.5.

Category Description	Sample Size	Fixed-Weight Linear Clones									
		Annual Mean Return (%)		Annual SD (%)		Annual Sharpe		ρ_1(%)		p-value(Q_{12}) (%)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Funds											
Convertible Arbitrage	82	8.41	5.11	6.20	5.28	2.70	5.84	42.2	17.3	11.0	22.2
Dedicated Short Bias	10	5.98	4.77	28.27	10.05	0.25	0.24	5.5	12.6	24.2	20.3
Dedicated Short Bias*	9	4.92	3.58	28.75	10.53	0.20	0.20	3.4	11.3	25.5	21.1
Emerging Markets	102	20.41	13.01	22.92	15.16	1.42	2.11	18.0	12.4	36.3	30.2
Equity Market Neutral	83	8.09	4.77	7.78	5.84	1.44	1.20	9.1	23.0	32.6	29.7
Event Driven	169	13.03	8.65	8.40	8.09	1.99	1.37	22.2	17.6	27.0	29.3
Fixed Income Arbitrage	62	9.50	4.54	6.56	4.41	2.05	1.48	22.1	17.6	35.9	35.2
Global Macro	54	11.38	6.16	11.93	6.10	1.07	0.58	5.8	12.2	43.1	32.5
Long/Short Equity Hedge	520	14.59	8.14	15.96	9.06	1.06	0.58	12.8	14.9	36.0	30.5
Managed Futures	114	13.64	9.35	21.46	12.07	0.67	0.39	2.5	10.2	40.1	31.5
Multi-Strategy	59	10.79	5.22	8.72	9.70	1.86	1.03	21.0	20.1	28.2	30.1
Fund of Funds	355	8.25	3.73	6.36	4.47	1.66	0.86	23.2	15.0	27.1	26.3
All Except Fund of Funds	1255	13.29	8.71	13.95	10.76	1.39	1.88	15.7	18.3	33.2	30.9
Linear Clones											
Convertible Arbitrage	82	7.40	3.17	6.20	5.28	1.52	0.62	10.7	10.5	55.6	24.9
Dedicated Short Bias	10	6.70	11.59	28.27	10.05	0.32	0.48	2.8	5.9	73.6	17.5
Dedicated Short Bias*	9	3.61	6.61	28.75	10.53	0.19	0.29	3.7	5.6	77.3	14.0
Emerging Markets	102	14.77	11.47	22.92	15.16	0.88	0.58	0.0	9.0	62.7	27.6
Equity Market Neutral	83	10.00	7.00	7.78	5.84	1.42	0.58	1.8	9.6	57.0	24.7
Event Driven	169	9.84	6.69	8.40	8.09	1.43	0.52	4.3	11.0	55.8	24.1
Fixed Income Arbitrage	62	8.35	5.20	6.56	4.41	1.48	0.59	4.1	8.4	64.4	29.8
Global Macro	54	15.54	8.35	11.93	6.10	1.41	0.55	2.6	8.3	52.2	23.8
Long/Short Equity Hedge	520	13.12	8.68	15.96	9.06	0.98	0.57	-0.1	10.0	59.7	26.3
Managed Futures	114	27.97	16.32	21.46	12.07	1.36	0.40	4.7	8.1	61.4	29.0
Multi-Strategy	59	10.32	7.21	8.72	9.70	1.51	0.62	2.3	10.1	59.7	28.8
Fund of Funds	355	9.29	5.62	6.36	4.47	1.59	0.44	-0.1	11.1	50.5	24.7
All Except Fund of Funds	1255	13.27	10.48	13.95	10.76	1.19	0.61	2.2	10.2	59.2	26.4

Table 2.7: Performance comparison of fixed-weight and rolling-window linear clones of hedge funds in the TASS Live database and their corresponding funds, from February 1986 to September 2005. The category "Dedicated Short Bias*" excludes Fund 33735.

Category Description	Sample Size	24-Month Rolling-Window Linear Clones									
		Annual Mean Return (%)		Annual SD (%)		Annual Sharpe		ρ_1(%)		p-value(Q_6) (%)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Funds											
Convertible Arbitrage	82	4.04	7.83	5.76	4.55	2.31	8.96	42.3	16.2	12.4	19.4
Dedicated Short Bias	10	2.58	7.19	25.91	14.20	0.02	0.42	8.3	5.5	31.9	19.0
Dedicated Short Bias*	9	1.42	6.55	26.21	15.03	-0.04	0.39	7.4	4.9	35.2	16.8
Emerging Markets	102	21.12	13.86	19.95	14.06	1.74	2.57	16.0	14.3	39.2	28.1
Equity Market Neutral	83	5.71	4.14	6.60	5.91	1.44	1.68	5.3	24.0	40.2	33.9
Event Driven	169	11.65	10.45	7.62	7.68	2.01	1.43	17.2	17.8	31.1	29.8
Fixed Income Arbitrage	62	7.80	7.59	5.73	4.52	2.17	1.81	23.3	21.4	30.1	32.4
Global Macro	54	9.01	6.72	11.16	6.50	0.91	0.73	6.6	18.9	44.7	31.2
Long/Short Equity Hedge	520	11.90	8.93	13.90	8.69	1.04	0.77	9.8	16.7	42.0	28.5
Managed Futures	114	11.84	8.82	20.19	10.94	0.66	0.52	4.0	14.9	37.0	28.3
Multi-Strategy	59	8.97	6.13	7.65	10.10	1.86	1.25	18.3	22.5	29.1	28.6
Fund of Funds	355	7.34	3.95	5.68	4.29	1.67	0.97	22.6	16.3	24.0	26.5
All Except Fund of Funds	1255	11.15	9.86	12.38	10.12	1.38	2.64	13.5	19.8	36.6	29.8
Linear Clones											
Convertible Arbitrage	82	2.78	4.95	6.20	6.57	0.71	0.77	6.4	12.7	43.8	29.1
Dedicated Short Bias	10	6.83	16.18	29.31	15.61	0.09	0.45	0.4	8.8	36.7	28.7
Dedicated Short Bias*	9	9.08	15.41	30.00	16.39	0.17	0.40	-0.7	8.5	36.8	30.4
Emerging Markets	102	5.17	14.70	25.04	17.94	0.47	0.66	7.7	12.4	42.5	27.3
Equity Market Neutral	83	4.43	4.90	7.91	6.49	0.64	0.68	4.2	12.7	47.8	27.0
Event Driven	169	6.96	8.33	7.79	7.10	1.05	0.56	3.0	13.3	39.6	27.3
Fixed Income Arbitrage	62	4.47	4.63	6.85	5.17	0.84	0.71	4.3	9.9	40.8	30.0
Global Macro	54	12.97	8.90	12.48	7.38	1.08	0.59	4.1	11.1	45.3	28.2
Long/Short Equity Hedge	520	9.08	11.03	15.83	10.64	0.76	0.68	0.3	15.6	42.5	29.1
Managed Futures	114	19.24	13.32	22.96	13.71	0.91	0.57	5.5	10.9	46.5	27.7
Multi-Strategy	59	5.33	7.52	9.16	9.59	0.71	0.60	0.8	13.0	35.9	28.2
Fund of Funds	355	5.67	4.57	6.22	5.40	1.11	0.54	0.0	13.0	39.8	28.5
All Except Fund of Funds	1255	8.42	11.06	14.20	12.14	0.79	0.67	2.8	13.9	42.6	28.4

Table 2.7: (continued) Performance comparison of fixed-weight and rolling-window linear clones of hedge funds in the TASS Live database and their corresponding funds, from February 1986 to September 2005. The category "Dedicated Short Bias*" excludes Fund 33735.

2.4.2 Performance Results

Table 2.7 contains a comparison between the performance of fixed-weight and rolling-window linear clones and the original funds from which the clones are derived.[20] The results are striking—for several categories, the average mean return of the clones is only slightly lower than that of their fund counterparts, and in some categories, the clones do better. For example, the average mean return of the Convertible Arbitrage fixed-weight clones is 7.40%, and the corresponding figure for the funds is 8.41%. For Long/Short Equity Hedge funds, the average mean return for fixed-weight clones and funds is 13.12% and 14.59%, respectively. And in the Multi-Strategy category, the average mean return for fixed-weight clones and funds is 10.32% and 10.79%, respectively.

In five cases, the average mean return of the fixed-weight clones is higher than that of the funds: Dedicated Short Bias (6.70% vs. 5.98%), Equity Market Neutral (10.00% vs. 8.09%), Global Macro (15.54% vs. 11.38%), Managed Futures (27.97% vs. 13.64%), and Fund of Funds (9.29% vs. 8.25%). However, these differences are not necessarily statistically significant because of the variability in mean returns of funds and clones within their own categories. Even in the case of Managed Futures, the difference in average mean return between fixed-weight clones and funds—almost 15 percentage points—is not significant because of the large fluctuations in average mean returns of the Managed Futures fixed-weight clones and their corresponding funds (e.g., one standard deviation of the average mean of the Managed Futures fixed-weight clones is 16.32% according to Table 2.7, and one standard deviation of the average mean of the corresponding sample of funds is 9.35% according to Table 2.4). Nevertheless, these results suggest that for certain categories, the performance of fixed-weight clones may be comparable to that of their corresponding funds.

On the other hand, at 9.84%, the average performance of the Event-Driven fixed-weight clones is considerably lower than the 13.03% average for the funds. While also not statistically significant, this gap is understandable given the idiosyncratic and opportunistic nature of most event-driven strategies. Moreover, a significant source of the profitability of event-driven strategies is the illiquidity premium that managers earn by providing capital in times of distress. This illiquidity premium will clearly be missing from a clone portfolio of liquid securities, hence we should expect a sizable performance gap in this case. The same can be said for the Emerging Markets fixed-weight clones (14.77%) versus their fund counterparts (20.41%).

For Dedicated Short Bias funds, the difference in average mean return between fixed-weight clones and funds—6.70% and 5.98%, respectively—may seem somewhat counterintuitive in light of the expected-return decomposition in Table 2.6, where we observed that Dedicated Short Bias funds were responsible for more than 100% of the average total returns of funds in this category. The fact that Dedicated Short Bias clones have better average performance than the corresponding funds is due entirely to the clone of a single fund, 33735,

[20]Note that each type of clone has its own set of matching results for the funds. This is due to the fact that the first 24 months of each fund's history are used to calibrate the initial estimates of the rolling-window clones, hence they are not included in the rolling-window dataset from which fund and clone performance statistics are computed.

and when this outlier is dropped from the sample, the average mean return of the remaining 9 clones drops to 3.61% (see the "Dedicated Short Bias*" row).[21] The intuition for the underperformance of the fixed-weight clones in this category is clear—given the positive trend in the S&P 500 during the 1980's and 1990's, a passive strategy of shorting the S&P 500 is unlikely to have produced attractive returns when compared to the performance of more nimble discretionary shortsellers.

The results for the rolling-window clones are broadly consistent with those of the fixed-weight clones, though the average performance of rolling-window clones is typically lower than their fixed-weight counterparts. For example, the average mean returns of rolling-window clones for all categories except Dedicated Short Bias are lower than their fixed-weight versions, in some cases by a factor of two or three. Part of these differences can be explained by the different sample periods on which rolling-window clones are based—observe that the average mean returns of the underlying funds are lower in the rolling-window sample than in the fixed-weight sample for all categories except Emerging Markets. But the more likely source of the performance difference between rolling-window and fixed-weight clones is the combined effects of look-ahead bias for the fixed-weight clones and the increased estimation errors implicit in the rolling-window clones.

Given these two effects, the performance of the rolling-window clones is all the more remarkable in categories such as Dedicated Short Bias (6.83% average mean return vs. 2.58% average mean return for the corresponding sample of funds), Equity Market Neutral (4.43% clones vs. 5.71% funds), Global Macro (12.97% clones vs. 9.01% funds), Long/Short Equity Hedge (9.08% clones vs. 11.90% funds), and Managed Futures (19.24% clones vs. 11.84% funds). In the case of Dedicated Short Bias funds, it is not surprising that rolling-window clones are able to outperform both fixed-weight clones and the funds on which they are based—the rolling-window feature provides additional flexibility for capturing time-varying expected returns (such as the bull market of the 1980's and 1990's) that a fixed-weight strategy simply cannot. And in the case of Managed Futures, as with the fixed-weight clones, the rolling-window clones exhibit considerable cross-sectional variation in their mean returns hence the superior performance of clones in this case may not be statistically significant.

Nevertheless, as with fixed-weight clones, rolling-window clones also fall short substantially in the categories of Emerging Markets (5.17% clones vs. 21.12% funds), Event Driven (6.96% clones vs. 11.65% funds), and Fixed Income Arbitrage (4.47% vs. 7.80%). Funds in these categories earn part of their expected return from bearing illiquidity risk, which is clearly absent from the clone portfolios constructed with the five factors we employ. Therefore, we should expect clones to underperform their fund counterparts in these categories.

Another metric of comparison between clones and funds is the average Sharpe ratio, which adjusts for the volatilities of the respective strategies. Of course, given our renormalization

[21] Specifically, fund 33735 has a small but positive SP500 beta coefficient, hence the clone portfolio for this fund is long the S&P 500 throughout the sample period from April 1997 to March 2005, implying a strong positive contribution for the SP500 factor. Because the SP500 beta coefficient is small and the SP500 factor is the most volatile of the five factors, the un-renormalized volatility of the clone portfolio is considerably smaller than the volatility of the fund, which causes our renormalization process to magnify the positive mean return of the clone substantially.

process (2.7), the standard deviations of the fixed-weight clones are identical to their fund counterparts, so a comparison of Sharpe ratios reduces to a comparison of mean returns in this case. However, the average Sharpe ratio of a category is not the same as the ratio of that category's average mean return to its average volatility, so the Sharpe ratio statistics in Table 2.7 and Figure 2-3 do provide some incremental information. Moreover, for rolling-window clones, there may be some differences in volatilities depending on the time series properties of the underlying funds, which makes Sharpe ratio comparisons more informative.

The average Sharpe ratio of the fixed-weight sample of Convertible Arbitrage funds is 2.70, which is almost twice the average Sharpe ratio of 1.52 for the fixed-weight clones, a significant risk-adjusted performance gap. Noticeable gaps also exist for Event Driven, Emerging Markets, and Fixed Income Arbitrage clones versus funds (recall that funds in these categories are likely to earn illiquidity risk premia not available to the corresponding clones). However, there is virtually no difference in average Sharpe ratios between fixed-weight clones and funds in the Dedicated Short Bias, Equity Market Neutral, Long/Short Equity Hedge, Multi-Strategy, and Fund of Funds categories. And for Global Macro and Managed Futures, the average Sharpe ratios of the fixed-weight clones are, in fact, higher than those of the funds in these categories.

The gaps between average Sharpe ratios of rolling-window clones and those of the underlying funds tend to be more substantial—for the twin reasons cited above—but with some notable exceptions. On average, rolling-window clones in the Dedicated Short Bias, Global Macro, and Managed Futures categories do better than their fund counterparts on a risk-adjusted basis, with average Sharpe ratios of 0.09, 1.08, and 0.91, respectively, as compared to average Sharpe ratios of 0.02, 0.91, and 0.66, respectively, for the corresponding sample of funds.

2.4.3 Liquidity

Table 2.7 provides another comparison worth noting: the average first-order autocorrelation coefficients of clones and funds. The first-order autocorrelation ρ_1 is the correlation between a fund's current return and the previous month's return, and Lo (2001, 2002) and Getmansky, Lo, and Makarov (2004) observe that positive values for ρ_1 in hedge-fund returns is a proxy for illiquidity risk. Table 2.7 and Figure 2-4 show that the clones have much lower average autocorrelations than their fund counterparts, with the exception of Managed Futures for which both clones and funds have very low average autocorrelations. For example, the average autocorrelation of Convertible Arbitrage funds in the fixed-weight sample is 42.2%, and the corresponding average value for Convertible Arbitrage fixed-weight and rolling-window clones is only 10.7% and 6.4%, respectively. The average autocorrelation of Fund of Funds is 23.2% in the fixed-weight sample, and the corresponding values for the fixed-weight and rolling-window clones is only -0.1% and 0.0%, respectively.

The last two columns of each of the two sub-panels Table 2.7 provide a more formal measure of the statistical significance of autocorrelation in the monthly returns of clones and funds, the Ljung-Box Q-statistic, based on the first 12 autocorrelation coefficients in the

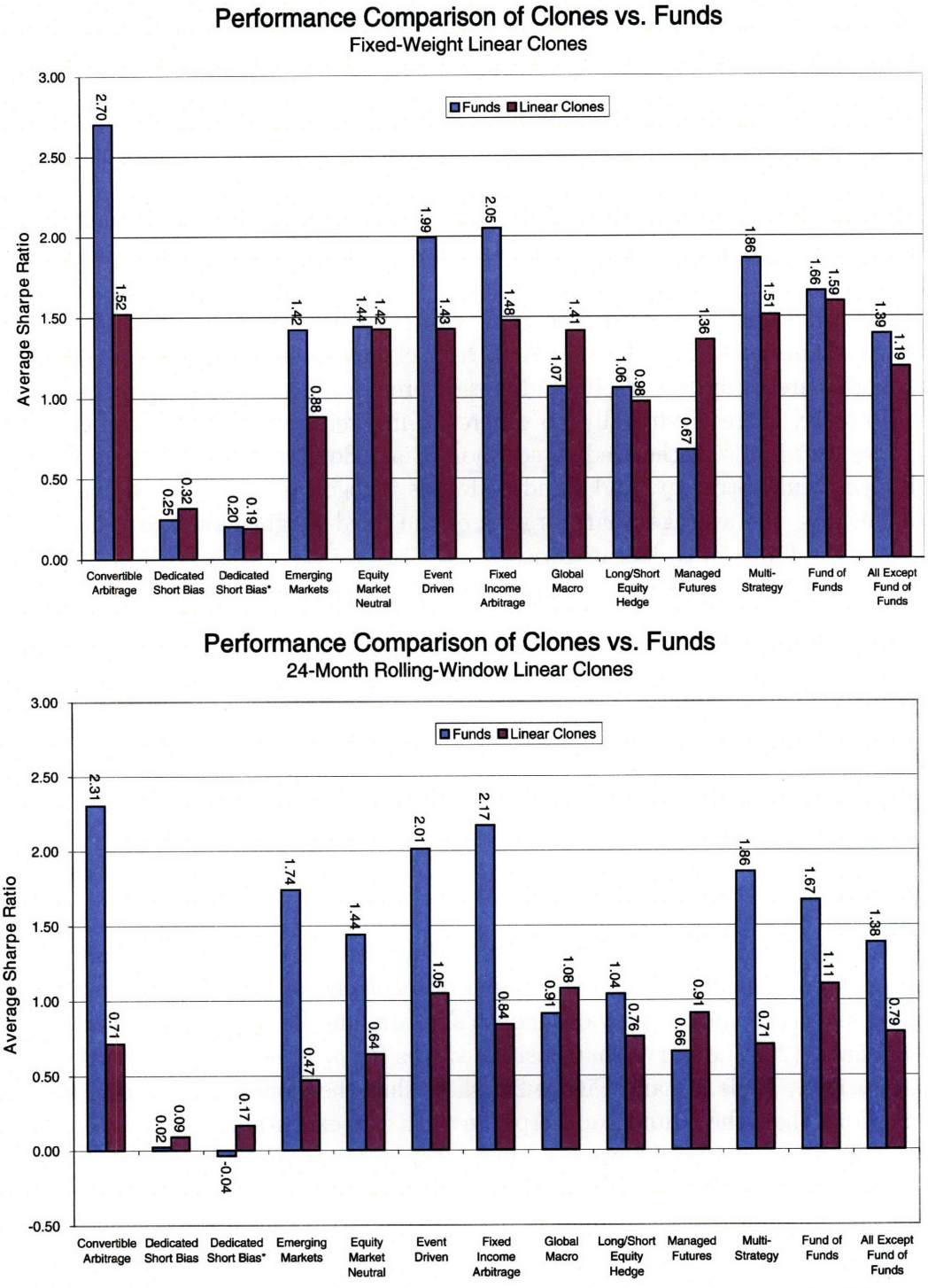

Figure 2-3: Comparison of average Sharpe ratios of fixed-weight and 24-month rolling-window linear clones and their corresponding funds in the TASS Live database, from February 1986 to September 2005. The category "Dedicated Short Bias*" excludes Fund 33735.

fixed-weight case and on the first 6 autocorrelation coefficients in the rolling-window case.[22] Smaller p-values indicate more statistically significant autocorrelations, and for every single category, the average p-value of the funds is lower than that of the clones. These results confirm our intuition that, by construction, clones are more liquid than their corresponding funds, highlighting another potential advantage of clone portfolios over direct investments in hedge funds. However, this advantage comes at a cost; as we saw in Section 2.4.2, the performance gap between clones and funds is particularly large for those categories with the highest levels of illiquidity exposure.

2.4.4 Leverage Ratios

Another consideration in evaluating the practical significance of fixed-weight linear clones is the magnitudes of the renormalization factors γ_i. As discussed in Section 2.4.1, these factors represent adjustments in the clone portfolios' leverage so as to yield comparable levels of volatility. If the magnitudes are too large, this may render the cloning process impractical for the typical investor, who may not have sufficient credit to support such leverage. The summary statistics in the left panel of Table 2.8 for the renormalization factors $\{\gamma_i\}$ suggest that this is not likely to be a concern—the average γ_i across all funds in the fixed-weight sample is 2.05, and the median value is 1.81, implying that the typical amount of additional leverage required to yield fixed-weight clones of comparable volatility is 81% to 105% on average, which is far less than the leverage afforded by standard futures contracts such as the S&P 500.[23] For the individual categories, the average value of γ_i for fixed-weight clones varies from a low of 1.69 for Fund of Funds to a high of 2.76 for Managed Futures. This accords well with our intuition that Fund of Funds is lower in volatility because of its diversified investment profile, and Managed Futures is higher in volatility given the leverage already incorporated into the futures contracts traded by CTAs and CPOs. In fact, outside of the Managed Futures category, even the maximum values for γ_i are relatively mild—ranging from 2.92 for Convertible Arbitrage to 8.85 for Dedicated Short Bias—and the maximum value of 18.35 for Managed Futures is also reasonably conservative for that category (see footnote 23).

[22] Ljung and Box (1978) propose the following statistic to gauge the significance of the first m autocorrelation coefficients of a time series with T observations:

$$Q = T(T+2)\sum_{k=1}^{m}\hat{\rho}_k^2/(T-k) \tag{2.16}$$

which is asymptotically χ_m^2 under the null hypothesis of no autocorrelation. By forming the sum of squared autocorrelations, the statistic Q reflects the absolute magnitudes of the $\hat{\rho}_k$'s irrespective of their signs, hence funds with large positive or negative autocorrelation coefficients will exhibit large Q-statistics.

[23] As of July 28, 2006, the initial margin requirement of the S&P 500 futures contract that trades on the Chicago Mercantile Exchange is $19,688, with a maintenance margin requirement of $15,750. Given the contract value of $250 times the S&P 500 Index and the settlement price of 1284.30 on July 28, 2006 for the September 2006 contract, the initial and maintenance margin requirements are 6.1% and 4.9% of the contract value, respectively, implying leverage ratios of 16.3 and 20.4, respectively. See http://www.cme.com for further details.

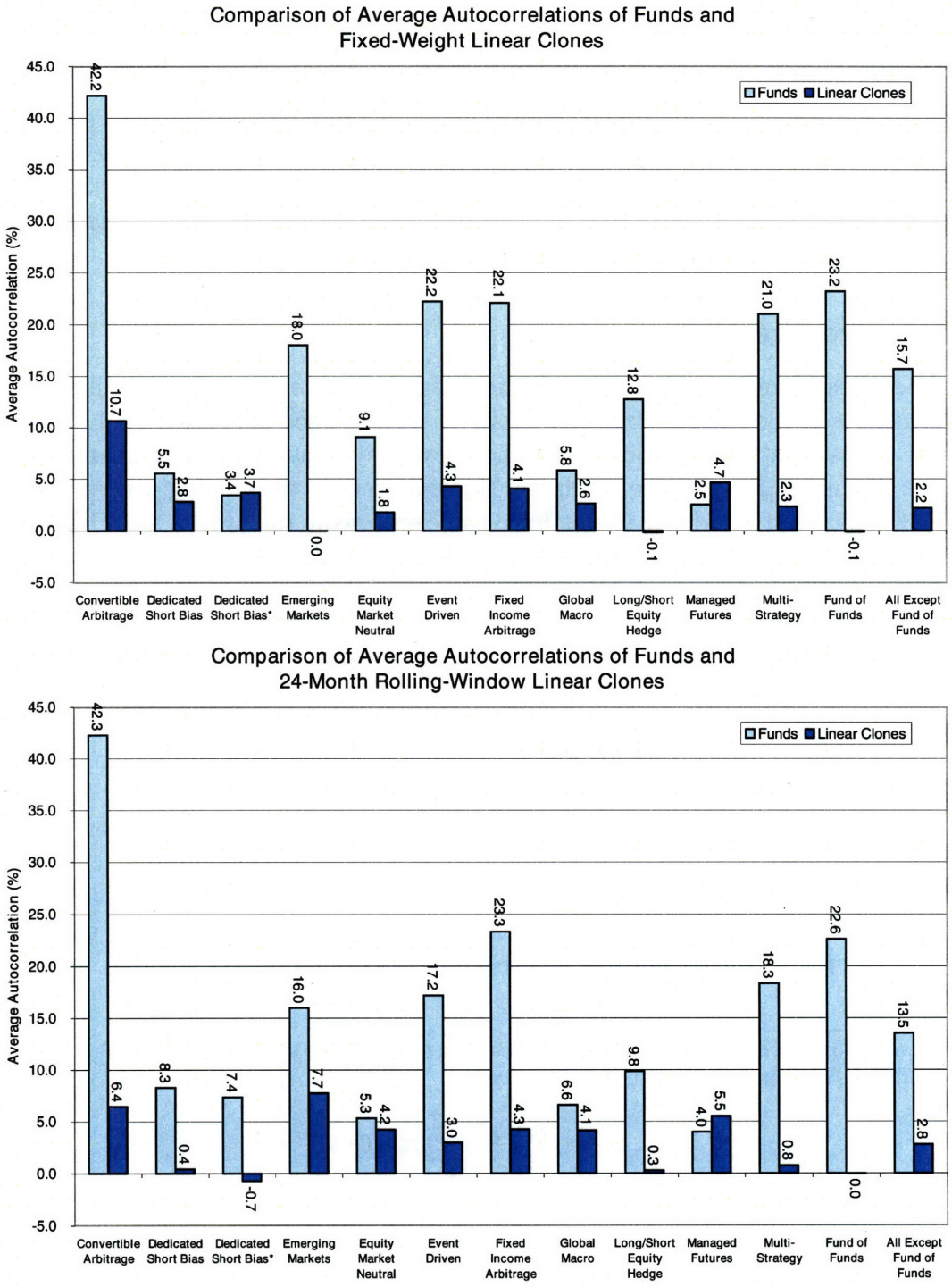

Figure 2-4: Comparison of average first-order autocorrelation coefficients of fixed-weight and 24-month rolling-window linear clones and their corresponding funds in the TASS Live database, from February 1986 to September 2005. The category "Dedicated Short Bias*" excludes Fund 33735.

Developing intuition for the leverage ratios for the rolling-window clones is slightly more challenging because they vary over time for each clone, so the right panel of Table 2.8 reports the cross-sectional means and standard deviations of the time-series means, standard deviations, first-order autocorrelations, and Q-statistic p-values of each clone i's $\{\gamma_{it}\}$. For example, the value 1.62 is the mean across all rolling-window clones of the time-series mean leverage ratio of each clone, and the value 0.46 is the cross-sectional standard deviation, across all rolling-window clones, of those time-series means. Table 2.8 shows that the average time-series-mean leverage ratios for rolling-window clones are somewhat lower than their fixed-weight counterparts but roughly comparable, ranging from a low of 1.38 for Fund of Funds to a high of 1.97 for Managed Futures, with standard deviations of the time-series means ranging from 0.31 for Fund of Funds to 0.75 for Dedicated Short Bias (recall that Dedicated Short Bias has only 10 funds, and that its short-bias mandate during the bull market is also likely to create more active rebalancings, contributing to more volatile leverage ratios). However, none of these leverage ratios fall outside the realm of practical possibility for the five instruments implicit in the cloning process.

Category Description	Sample Size	Fixed-Weight Linear Clone Renormalization Factor					24-Month Rolling-Window Linear Clone Renormalization Factor							
		Min	Med	Mean	Max	SD	TS-Mean		TS-SD		ρ_1		p-value(Q6)	
							Mean	SD	Mean	SD	Mean	SD	Mean	SD
All Funds	1,610	0.11	1.81	2.05	18.35	0.96	1.62	0.46	0.36	0.28	80.7	14.6	1.9	9.4
Convertible Arbitrage	82	0.11	1.64	1.71	2.92	0.53	1.44	0.40	0.27	0.19	77.1	21.0	3.6	12.6
Dedicated Short Bias	10	1.13	1.51	2.26	8.85	2.34	1.57	0.75	0.34	0.36	82.4	12.2	0.9	2.8
Emerging Markets	102	0.26	1.95	2.13	5.17	0.82	1.68	0.45	0.45	0.38	83.8	10.4	0.5	2.8
Equity Market Neutral	83	0.39	2.17	2.18	4.25	0.80	1.78	0.54	0.40	0.26	77.6	17.4	5.2	17.3
Event Driven	169	0.40	1.60	1.78	4.45	0.62	1.44	0.36	0.28	0.21	81.5	13.1	1.5	8.2
Fixed Income Arbitrage	62	0.40	1.69	2.07	5.46	1.01	1.47	0.40	0.32	0.21	79.0	14.9	2.9	12.2
Global Macro	54	1.13	2.44	2.60	5.67	1.15	1.86	0.45	0.44	0.34	78.2	17.7	2.0	6.3
Long/Short Equity Hedge	520	1.02	1.92	2.18	6.32	0.89	1.75	0.46	0.38	0.26	79.3	15.1	1.6	8.6
Managed Futures	114	1.17	2.41	2.76	18.35	1.76	1.97	0.46	0.56	0.37	82.5	12.4	1.3	8.9
Multi-Strategy	59	0.45	1.89	2.04	3.75	0.75	1.57	0.46	0.38	0.30	81.8	11.7	1.6	9.5
Fund of Funds	355	0.75	1.58	1.69	7.53	0.65	1.38	0.31	0.27	0.20	82.8	13.3	1.7	8.8

Table 2.8: Summary statistics for renormalization factors γ_i of fixed-weight and 24-month rolling-window clones of hedge funds in the TASS Live database, from February 1986 to September 2005.

2.4.5 Equal-Weighted Clone Portfolios

The results in Sections 2.4.2–2.4.4 suggest that clone portfolios consisting primarily of futures and forward contracts, properly leveraged, can yield comparable volatility levels and some of the same risk exposures as certain types of hedge-fund strategies. But these impressions are based on averages of the 1,610 funds in our sample and their corresponding clones, not on specific realizable portfolios. To address this issue, in this section we report the characteristics of equal-weighted portfolios of all fixed-weight and rolling-window clones, and compare them to the characteristics of equal-weighted portfolios of the corresponding funds. By including all clones and funds in each of their respective portfolios, we avoid the potential selection biases that can arise from picking a particular subset of clones, e.g., those with particularly high $\overline{R}^2$'s or statistically significant factor exposures.

Figure 2-5 plots the cumulative returns of the equal-weighted portfolios of fixed-weight and rolling-window clones, as well as the equal-weighted portfolios of their respective funds and the S&P 500. The top panel shows that the equal-weighted portfolio of all fixed-weight clones outperforms both the equal-weighted portfolio of corresponding funds and the S&P 500 over the sample period. However, the bottom panel shows that the performance of the equal-weighted portfolio of 24-month rolling-window clones is not quite as impressive, underperforming both the funds portfolio and the S&P 500. However, the clones portfolio underperforms the S&P 500 only slightly, and apparently with less volatility as visual inspection suggests.

Tables 2.9 and 2.10 and Figure 2-6 provide a more detailed performance comparison of the portfolios of clones and funds. In particular, Figure 2-6, which plots the Sharpe ratios of the equal-weighted portfolios of the two types of clones and their corresponding funds, for all funds and category by category, shows that for some categories the fixed-weight clone portfolio underperforms the fund portfolio, e.g., Dedicated Short Bias (0.09 for the clone portfolio vs. 0.28 for the fund portfolio), Emerging Markets (0.71 clones vs. 1.26 funds), Event Driven (1.89 clones vs. 3.08 funds), Fixed Income Arbitrage (1.79 clones vs. 2.93 funds), and Multi-Strategy (1.62 clones vs. 2.52 funds). However, in other categories, the fixed-weight clone portfolios have comparable performance and, in some cases, superior performance, e.g., Managed Futures, where the fixed-weight clone portfolio exhibits a Sharpe ratio of 1.80 versus 0.83 for the corresponding fund portfolio. When all clones are used to construct an equal-weighted portfolio, Table 2.9 reports an annualized mean return of 20.44% with an annualized standard deviation of 10.23% over the sample period, implying a Sharpe ratio of 2.00. The annualized mean and standard deviation for an equal-weighted portfolio of all funds are 14.76% and 9.06%, respectively, yielding a Sharpe ratio of 1.63.

The lower panel of Figure 2-6 provides a comparison of the Sharpe ratios of the rolling-window clone portfolios with their fund counterparts, which exhibits patterns similar patterns to those of the fixed-weight fund and clone portfolios. The rolling-window clone portfolios underperform in some categories but yield comparable performance in others, and superior performance in the categories of Dedicated Short Bias (0.19 clones vs. 0.12 funds), Equity Market Neutral (1.42 clones vs. 1.04 funds), Global Macro (1.48 clones vs. 1.39 funds), and Fund of Funds (1.68 clones vs. 1.61 funds). For the equal-weighted portfolio of all rolling-

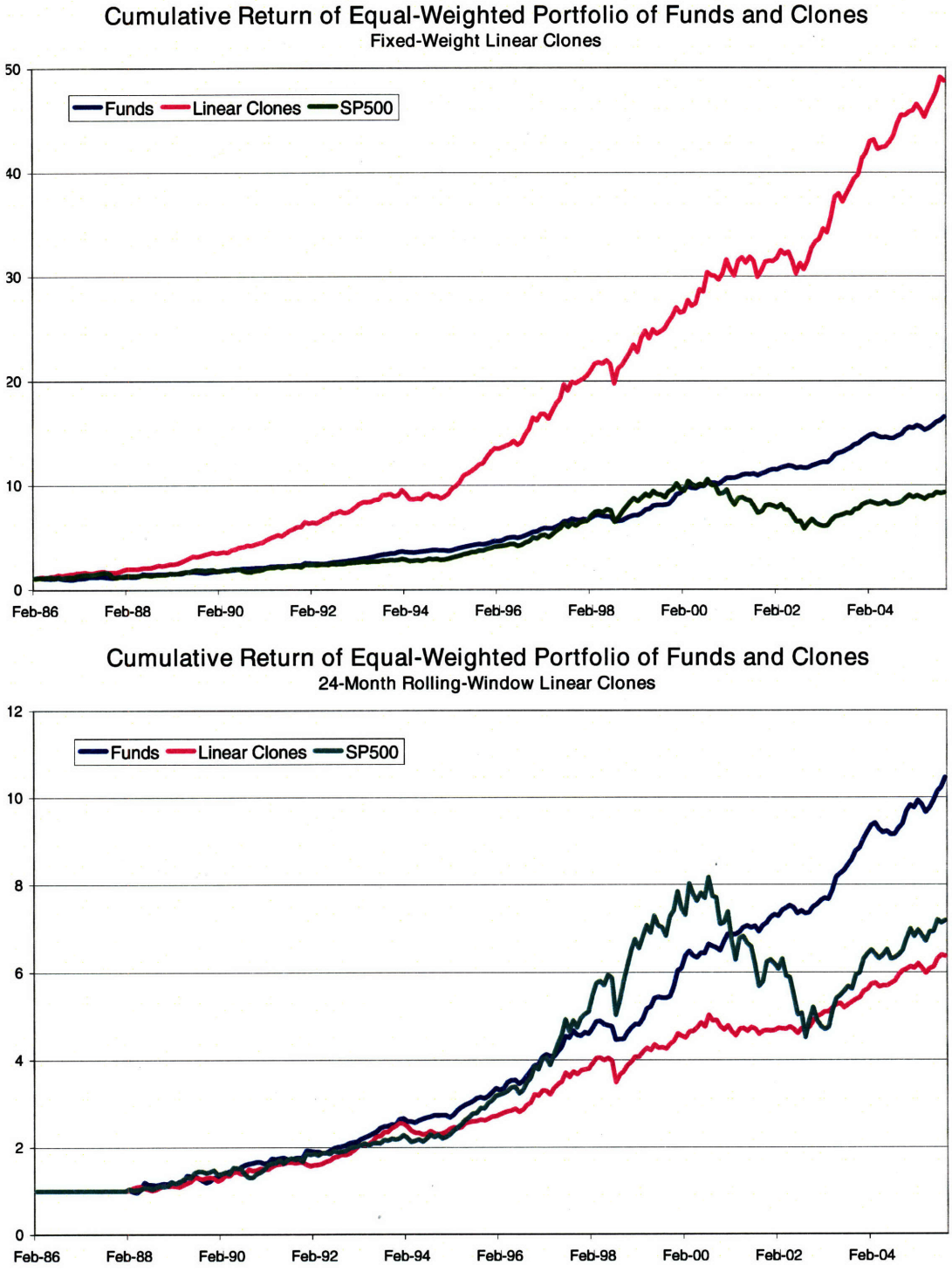

Figure 2-5: Cumulative returns of equal-weighted portfolios of funds and fixed-weight and 24-month rolling-window linear clones, and the S&P 500 index, from February 1986 to September 2005.

Statistic	All Funds		Convertible Arb		Dedicated Short Bias		Emerging Markets	
	Funds	Clones	Funds	Clones	Funds	Clones	Funds	Clones
Annual Compound Return	15.34	21.85	11.50	10.17	3.78	-1.01	22.83	12.45
Annualized Mean	14.76	20.44	11.07	9.87	6.40	2.41	22.34	13.69
Annualized SD	9.06	10.23	5.36	5.45	23.23	26.45	17.71	19.28
Annualized Sharpe	1.63	2.00	2.07	1.81	0.28	0.09	1.26	0.71
Skewness	1	0	0	0	0	0	-1	-1
Kurtosis	5	0	3	2	2	1	5	3
ρ_1 (≥ 20% highlighted)	11	-6	31	9	13	3	36	-3
ρ_2 (≥ 20% highlighted)	-10	5	6	7	-12	-8	7	-3
ρ_3 (≥ 20% highlighted)	-11	0	-4	-2	-6	9	-3	6
Correlations To Various Market Indexes (≥ 50% highlighted, ≤ -25% highlighted):								
S&P 500 Index	44	69	48	63	-66	-90	47	88
MSCI World Index	40	59	42	52	-71	-92	51	81
Russell 1000 Index	44	68	49	63	-70	-90	48	88
Russell 2000 Index	45	49	52	54	-84	-73	52	73
NASDAQ 100 Stock Index	38	53	42	48	-78	-74	40	74
BBA LIBOR USD 3-Month	-13	-37	-29	-35	2	-12	-8	-6
DJ Lehman Bond Comp GLBL	13	57	22	49	2	7	-5	17
US Treasury N/B	-10	-46	-10	-35	-16	-34	12	7
Gold (Spot $/oz)	5	-6	-9	-1	-15	-8	0	6
Oil (Generic 1st 'CL' Future)	-5	16	-20	-9	-14	-9	-9	9
U.S. Dollar Spot Index	2	-10	6	1	7	21	9	-15
Five Risk Factors:								
CREDIT	3	-9	20	30	-39	-53	38	55
USD	-15	-13	-2	-1	35	59	-13	-44
BOND	13	63	24	58	10	25	-2	9
SP500	44	69	48	63	-66	-90	47	88
DVIX	-22	-32	-24	-43	50	70	-36	-64
CMDTY	5	27	-14	-1	-12	-13	0	16
CSFB/Tremont Indexes:								
All Funds	82	56	46	50	-65	-42	55	47
Convertible Arbitrage	47	26	79	37	-19	-8	34	21
Dedicated Short Bias	-69	-62	-44	-43	84	77	-58	-77
Emerging Markets	72	44	42	38	-64	-58	94	55
Equity Market Neutral	50	39	36	25	-29	-39	26	38
Event Driven	77	57	64	56	-57	-56	69	63
Fixed Income Arbitrage	33	20	39	30	-5	5	24	10
Global Macro	54	36	26	36	-25	-6	28	17
Long/Short Equity Hedge	82	61	43	47	-79	-58	55	64
Managed Futures	14	0	-12	-4	10	17	-13	-11
Multi-Strategy	23	13	29	20	-22	-10	0	13

Table 2.9: Performance comparison of equal-weighted portfolios of all fixed-weight linear clones versus funds in the TASS Live database, from February 1986 to September 2005.

Statistic	Equity Market Neutral		Event Driven		Fixed-Income Arbitrage		Global Macro	
	Funds	Clones	Funds	Clones	Funds	Clones	Funds	Clones
Annual Compound Return	13.40	19.99	14.22	11.95	10.93	7.91	15.56	24.90
Annualized Mean	12.83	18.66	13.47	11.53	10.48	7.73	14.91	22.87
Annualized SD	6.23	7.73	4.37	6.11	3.58	4.31	8.64	9.40
Annualized Sharpe	2.06	2.41	3.08	1.89	2.93	1.79	1.73	2.43
Skewness	1	1	-1	-1	-6	0	1	0
Kurtosis	4	1	8	2	59	3	5	0
ρ_1 (≥ 20% highlighted)	1	12	32	0	27	-2	17	17
ρ_2 (≥ 20% highlighted)	3	14	10	4	13	5	3	9
ρ_3 (≥ 20% highlighted)	21	16	-1	2	1	1	-7	11
Correlations To Various Market Indexes (≥ 50% highlighted, ≤ -25% highlighted):								
S&P 500 Index	6	37	58	78	-5	-4	10	47
MSCI World Index	9	23	49	62	-6	-10	6	38
Russell 1000 Index	6	36	60	78	-4	-4	10	47
Russell 2000 Index	-1	18	71	64	2	2	7	30
NASDAQ 100 Stock Index	3	26	52	66	2	-3	3	33
BBA LIBOR USD 3-Month	-8	-29	-8	-22	-4	-25	-13	-35
DJ Lehman Bond Comp GLBL	15	52	-6	26	6	39	13	66
US Treasury N/B	-9	-52	8	-18	-8	-48	-13	-58
Gold (Spot $/oz)	1	1	-5	-7	-1	7	15	6
Oil (Generic 1st 'CL' Future)	16	29	-1	2	10	20	17	17
U.S. Dollar Spot Index	-15	2	18	9	11	17	-5	-10
Five Risk Factors:								
CREDIT	-9	-15	37	37	19	19	2	0
USD	-10	14	-2	-1	18	32	-4	-7
BOND	11	67	3	38	14	60	17	78
SP500	6	38	58	78	-4	-4	10	48
DVIX	6	-21	-50	-50	27	0	0	-28
CMDTY	17	38	5	12	7	24	18	25
CSFB/Tremont Indexes:								
All Funds	34	48	63	57	37	29	61	49
Convertible Arbitrage	38	24	53	31	48	32	26	28
Dedicated Short Bias	-26	-31	-73	-68	4	7	-24	-35
Emerging Markets	21	24	60	49	21	7	24	26
Equity Market Neutral	51	29	36	36	-4	-1	36	28
Event Driven	38	35	89	64	24	18	38	42
Fixed Income Arbitrage	26	22	33	22	79	37	18	25
Global Macro	22	43	31	35	42	36	58	40
Long/Short Equity Hedge	36	39	71	60	12	8	42	42
Managed Futures	1	9	-17	-7	-3	9	40	8
Multi-Strategy	27	8	21	16	35	22	31	13

Table 2.9: (continued) Performance comparison of equal-weighted portfolios of all fixed-weight linear clones versus funds in the TASS Live database, from February 1986 to September 2005.

Statistic	Long/Short Equity Hedge		Managed Futures		Multi-Strategy		Fund of Funds	
	Funds	Clones	Funds	Clones	Funds	Clones	Funds	Clones
Annual Compound Return	16.79	17.40	15.15	38.37	15.43	15.08	12.30	18.74
Annualized Mean	16.35	17.15	15.96	34.73	14.59	14.51	11.93	17.61
Annualized SD	11.84	14.01	19.24	19.32	5.78	8.94	7.48	7.97
Annualized Sharpe	1.38	1.22	0.83	1.80	2.52	1.62	1.59	2.21
Skewness	-2	-1	1	0	2	1	2	0
Kurtosis	18	5	2	0	8	7	7	1
ρ_1 (≥ 20% highlighted)	14	-6	5	9	**22**	-7	**20**	5
ρ_2 (≥ 20% highlighted)	-3	-3	-15	-4	15	-2	-8	8
ρ_3 (≥ 20% highlighted)	-6	2	-13	1	15	12	-10	-1
Correlations To Various Market Indexes (≥ 50% highlighted, ≤ -25% highlighted):								
S&P 500 Index	**77**	**95**	-1	-2	43	**71**	31	**66**
MSCI World Index	**63**	**78**	-1	-2	44	**60**	29	49
Russell 1000 Index	**79**	**95**	-3	-2	44	**71**	31	**65**
Russell 2000 Index	**86**	**78**	-7	-13	45	**53**	32	49
NASDAQ 100 Stock Index	**72**	**78**	-7	-9	41	**58**	28	49
BBA LIBOR USD 3-Month	-5	-12	-13	**-40**	-15	-19	-9	**-35**
DJ Lehman Bond Comp GLBL	-7	14	27	**81**	10	40	10	45
US Treasury N/B	8	-7	**-28**	**-85**	3	**-28**	-9	**-40**
Gold (Spot $/oz)	-10	-11	13	6	3	-4	10	-10
Oil (Generic 1st 'CL' Future)	-5	7	1	25	9	21	-2	17
U.S. Dollar Spot Index	17	8	-14	**-27**	-6	-6	9	5
Five Risk Factors:								
CREDIT	29	28	-24	**-60**	23	18	2	0
USD	-7	-12	-11	-11	-8	-10	-9	7
BOND	2	21	23	**88**	6	41	12	**60**
SP500	**77**	**95**	-1	-1	43	**71**	31	**66**
DVIX	**-56**	**-61**	13	18	**-28**	**-45**	-9	**-34**
CMDTY	3	18	7	34	16	30	8	29
CSFB/Tremont Indexes:								
All Funds	**72**	**55**	23	17	**62**	**55**	**91**	**57**
Convertible Arbitrage	37	21	1	7	46	24	**52**	28
Dedicated Short Bias	**-82**	**-74**	13	13	**-52**	**-55**	**-57**	**-53**
Emerging Markets	**64**	**52**	-9	-11	50	40	**70**	40
Equity Market Neutral	46	41	18	12	47	37	48	35
Event Driven	**74**	**62**	-12	-7	**61**	**51**	**76**	**54**
Fixed Income Arbitrage	21	12	8	13	25	20	43	25
Global Macro	37	29	35	25	35	37	**68**	40
Long/Short Equity Hedge	**89**	**65**	4	7	**64**	**58**	**83**	**56**
Managed Futures	-7	-7	**84**	34	6	2	16	2
Multi-Strategy	20	11	7	-1	38	13	27	14

Table 2.9: (continued) Performance comparison of equal-weighted portfolios of all fixed-weight linear clones versus funds in the TASS Live database, from February 1986 to September 2005.

Statistic	All Funds		Convertible Arb		Dedicated Short Bias		Emerging Markets	
	Funds	Clones	Funds	Clones	Funds	Clones	Funds	Clones
Annual Compound Return	14.21	12.83	11.07	6.88	-0.64	1.53	16.92	5.34
Annualized Mean	13.71	12.69	10.71	6.84	3.40	5.92	17.43	8.58
Annualized SD	8.51	10.60	5.79	5.85	27.86	30.63	18.16	24.15
Annualized Sharpe	1.61	1.20	1.85	1.17	0.12	0.19	0.96	0.36
Skewness	1	0	0	1	0	1	-1	-2
Kurtosis	8	4	5	3	6	6	6	15
ρ_1 (≥ 20% highlighted)	5	2	12	-5	8	-2	30	7
ρ_2 (≥ 20% highlighted)	-7	-7	13	9	-8	-28	4	-1
ρ_3 (≥ 20% highlighted)	-16	5	4	-2	0	24	-2	2
Correlations To Various Market Indexes (≥ 50% highlighted, ≤ -25% highlighted):								
S&P 500 Index	41	52	40	61	-57	-78	53	76
MSCI World Index	28	37	39	50	-63	-79	57	69
Russell 1000 Index	41	52	42	61	-61	-78	54	77
Russell 2000 Index	42	37	49	46	-80	-53	55	60
NASDAQ 100 Stock Index	35	41	41	46	-76	-67	44	62
BBA LIBOR USD 3-Month	-11	-13	-27	-21	3	-24	-5	-4
DJ Lehman Bond Comp GLBL	6	24	20	31	3	8	-9	1
US Treasury N/B	-8	-17	-6	-20	-14	-34	15	12
Gold (Spot $/oz)	3	3	-5	-6	-14	7	6	2
Oil (Generic 1st 'CL' Future)	0	15	-8	-2	-17	-16	-1	6
U.S. Dollar Spot Index	13	4	-2	4	8	20	11	3
Five Risk Factors:								
CREDIT	13	16	23	36	-34	-45	42	50
USD	-4	-9	-7	-3	30	44	-20	-16
BOND	14	30	20	37	12	29	-4	4
SP500	41	52	40	61	-57	-78	53	76
DVIX	-20	-38	-16	-33	46	60	-44	-62
CMDTY	8	21	-2	4	-11	-20	7	6
CSFB/Tremont Indexes:								
All Funds	83	56	49	39	-81	-27	58	47
Convertible Arbitrage	44	31	81	30	-11	-3	34	21
Dedicated Short Bias	-67	-66	-44	-47	79	56	-59	-69
Emerging Markets	69	50	40	37	-71	-41	94	53
Equity Market Neutral	48	43	30	19	-12	-30	27	26
Event Driven	75	61	62	48	-60	-38	70	67
Fixed Income Arbitrage	34	23	45	26	-4	-7	27	20
Global Macro	58	35	29	26	-39	5	32	21
Long/Short Equity Hedge	80	59	45	38	-83	-31	57	57
Managed Futures	18	-9	-14	-13	6	24	-15	-27
Multi-Strategy	21	3	35	10	-40	-39	-1	3

Table 2.10: Performance comparison of equal-weighted portfolios of all 24-month rolling-window linear clones versus funds in the TASS Live database, from February 1986 to September 2005.

Statistic	Equity Market Neutral		Event Driven		Fixed-Income Arbitrage		Global Macro	
	Funds	Clones	Funds	Clones	Funds	Clones	Funds	Clones
Annual Compound Return	7.53	12.05	13.64	10.18	8.60	4.57	12.74	17.92
Annualized Mean	7.55	11.77	12.95	9.90	8.36	4.56	12.44	17.26
Annualized SD	7.23	8.26	4.23	5.80	4.11	4.07	8.95	11.66
Annualized Sharpe	1.04	1.42	3.06	1.71	2.03	1.12	1.39	1.48
Skewness	-2	1	-2	-1	-7	-1	0	0
Kurtosis	7	2	12	6	68	4	3	1
ρ_1 (≥ 20% highlighted)	3	14	36	-6	26	-14	8	12
ρ_2 (≥ 20% highlighted)	9	6	12	8	2	-19	-10	8
ρ_3 (≥ 20% highlighted)	-18	-8	-4	-2	-6	4	-3	8
Correlations To Various Market Indexes (≥ 50% highlighted, ≤ -25% highlighted):								
S&P 500 Index	12	24	52	65	-9	3	20	27
MSCI World Index	11	25	47	50	-9	-3	21	20
Russell 1000 Index	13	24	54	66	-8	3	21	27
Russell 2000 Index	15	12	63	48	2	11	20	12
NASDAQ 100 Stock Index	14	15	46	50	-1	2	13	15
BBA LIBOR USD 3-Month	-2	-30	-7	-16	-6	-11	-17	-21
DJ Lehman Bond Comp GLBL	12	43	-2	16	5	12	23	27
US Treasury N/B	-9	-38	9	-13	-7	-21	-19	-32
Gold (Spot $/oz)	-7	-2	5	-3	2	10	14	2
Oil (Generic 1st 'CL' Future)	8	18	5	9	10	16	2	13
U.S. Dollar Spot Index	-10	-5	11	13	13	15	-10	10
Five Risk Factors:								
CREDIT	-11	-3	45	36	22	31	2	3
USD	-7	5	-6	4	19	14	-12	0
BOND	10	51	4	28	14	31	25	39
SP500	12	24	52	66	-9	3	21	27
DVIX	-6	-12	-41	-47	27	-14	-5	-18
CMDTY	13	26	9	16	5	14	5	15
CSFB/Tremont Indexes:								
All Funds	33	37	63	57	34	21	61	43
Convertible Arbitrage	31	20	53	33	49	28	25	32
Dedicated Short Bias	-28	-32	-72	-63	6	-10	-26	-36
Emerging Markets	25	27	60	51	15	13	29	33
Equity Market Neutral	52	26	35	31	-9	9	33	39
Event Driven	37	36	90	64	24	27	35	40
Fixed Income Arbitrage	25	19	33	28	82	20	19	23
Global Macro	18	31	30	38	42	19	58	37
Long/Short Equity Hedge	38	33	70	57	9	11	44	35
Managed Futures	5	11	-17	-10	-6	6	43	12
Multi-Strategy	21	8	20	9	40	11	28	5

Table 2.10: (continued) Performance comparison of equal-weighted portfolios of all 24-month rolling-window linear clones versus funds in the TASS Live database, from February 1986 to September 2005.

Statistic	Long/Short Equity Hedge		Managed Futures		Multi-Strategy		Fund of Funds	
	Funds	Clones	Funds	Clones	Funds	Clones	Funds	Clones
Annual Compound Return	17.17	12.79	14.07	14.88	11.31	8.05	10.71	13.84
Annualized Mean	16.42	12.96	14.83	16.04	10.91	8.06	10.43	13.35
Annualized SD	9.82	13.04	18.19	20.58	5.45	7.74	6.49	7.96
Annualized Sharpe	1.67	0.99	0.82	0.78	2.00	1.04	1.61	1.68
Skewness	0	-1	1	0	0	0	1	0
Kurtosis	1	4	3	1	2	2	5	3
ρ_1 (≥ 20% highlighted)	17	-11	2	12	17	-13	5	1
ρ_2 (≥ 20% highlighted)	3	1	-14	-11	15	9	1	2
ρ_3 (≥ 20% highlighted)	-4	10	-12	2	22	9	-5	13
Correlations To Various Market Indexes (≥ 50% highlighted, ≤ -25% highlighted):								
S&P 500 Index	74	86	-5	-8	44	61	34	44
MSCI World Index	64	70	-12	-15	48	55	29	32
Russell 1000 Index	77	86	-6	-8	45	61	35	45
Russell 2000 Index	88	65	-9	-9	46	44	36	30
NASDAQ 100 Stock Index	74	69	-10	-8	44	53	29	35
BBA LIBOR USD 3-Month	-9	-6	-9	-12	-11	-2	-11	-12
DJ Lehman Bond Comp GLBL	6	15	19	34	4	17	9	25
US Treasury N/B	2	-4	-28	-42	2	-13	-9	-19
Gold (Spot $/oz)	-7	-8	9	10	8	-5	8	1
Oil (Generic 1st 'CL' Future)	-12	0	5	17	15	28	7	19
U.S. Dollar Spot Index	17	8	-3	-3	12	7	11	3
Five Risk Factors:								
CREDIT	28	29	-22	-28	27	29	14	13
USD	-3	-9	-2	-7	-9	0	-4	-2
BOND	10	16	23	41	7	22	15	33
SP500	74	86	-5	-8	43	61	34	45
DVIX	-48	-58	17	8	-17	-41	-13	-36
CMDTY	0	11	10	21	20	34	13	26
CSFB/Tremont Indexes:								
All Funds	73	52	25	14	58	41	90	55
Convertible Arbitrage	37	24	1	12	44	18	46	32
Dedicated Short Bias	-83	-72	13	1	-43	-52	-56	-59
Emerging Markets	63	52	-6	-2	51	34	68	46
Equity Market Neutral	43	40	16	21	34	31	49	41
Event Driven	74	61	-12	0	58	45	73	59
Fixed Income Arbitrage	23	17	10	7	27	15	39	26
Global Macro	39	28	37	18	34	26	69	38
Long/Short Equity Hedge	89	59	4	11	58	44	81	53
Managed Futures	-8	-14	83	27	7	2	20	-9
Multi-Strategy	18	7	4	-11	37	17	25	4

Table 2.10: (continued) Performance comparison of equal-weighted portfolios of all 24-month rolling-window linear clones versus funds in the TASS Live database, from February 1986 to September 2005.

window clones, the average return is 12.69% with a standard deviation of 10.60%, yielding a Sharpe ratio of 1.20; by comparison, the equal-weighted portfolio of all funds has a 13.71% average return with a standard deviation of 8.51%, yielding a Sharpe ratio of 1.61.

Tables 2.9 and 2.10 also report skewness, kurtosis, and autocorrelation coefficients for the two types of clone portfolios, which gives a more detailed characterization of the risks of the return streams. For some of the categories, the differences in these measures between clones and funds are quite striking. For example, according to Table 2.9, the portfolio of Fixed Income Arbitrage funds in the fixed-weight case exhibits a skewness coefficient of -6, a kurtosis coefficient of 59, and a first-order autocorrelation coefficient of 27%, implying a negatively skewed return distribution with fat tails and significant illiquidity exposure. In contrast, the portfolio of Fixed Income Arbitrage fixed-weight clones has a skewness of 0, a kurtosis of 3, and a first-order autocorrelation of -2%, and the portfolio of Fixed Income Arbitrage rolling-window clones has similar characteristics, which is consistent with the fact that the clone portfolios are comprised of highly liquid securities. Other examples of this difference in liquidity exposure include the portfolios of funds in Convertible Arbitrage, Emerging Markets, Event Driven, Multi-Strategy, and Fund of Funds categories, all of which exhibit significant positive first-order autocorrelation coefficients (31%, 36%, 32%, 22%, and 20%, respectively) in contrast to their fixed-weight clone counterparts (9%, -3%, 0%, -7%, and 5%, respectively). Similarly, the first-order autocorrelations of the portfolios of funds in these five categories using the rolling-window sample (12%, 30%, 36%, 17%, and 5%, respectively) are all larger than their rolling-window clone counterparts (-5%, 7%, -6%, -13%, and 1%).

While the statistical properties of clone portfolios may seem more attractive, it should be kept in mind that some of these characteristics are related to performance. In particular, one source of negative skewness and positive kurtosis is the kind of option-based strategies associated with Capital Decimation Partners (see Section 2.2.1), which is a legitimate source of expected return. And liquidity exposure is another source of expected return, as in the case of Fixed Income Arbitrage where one common theme is to purchase illiquid bonds and shortsell more liquid bonds with matching nominal cashflows. By reducing exposures to these risk factors through clones, we should expect a corresponding reduction in expected return. For example, in the case of Fixed Income Arbitrage, Table 2.9 reports that the portfolio of funds yields an average return of 10.48% with a standard deviation of 3.58% for a Sharpe ratio of 2.93, as compared to the fixed-weight portfolio of clones' average return of 7.73% with a standard deviation of 4.31% for a Sharpe ratio of 1.79.

In addition to its expected return and volatility, a portfolio's correlation with major market indexes is another important characteristic that concerns hedge-fund investors because of the diversification benefits that alternative investments have traditionally provided. Tables 2.9 and 2.10 show that the fixed-weight and rolling-window clone portfolios exhibit correlations that are similar to those of their matching portfolios of funds for a variety of stock, bond, currency, commodity, and hedge-fund indexes.[24] For example, the portfolio of

[24]Except for the SP500 and DVIX factors, the index returns used to compute the correlations in Tables 2.9 and 2.10 are derived solely from the indexes themselves in the usual way ($\text{Return}_t \equiv (\text{Index}_t -$

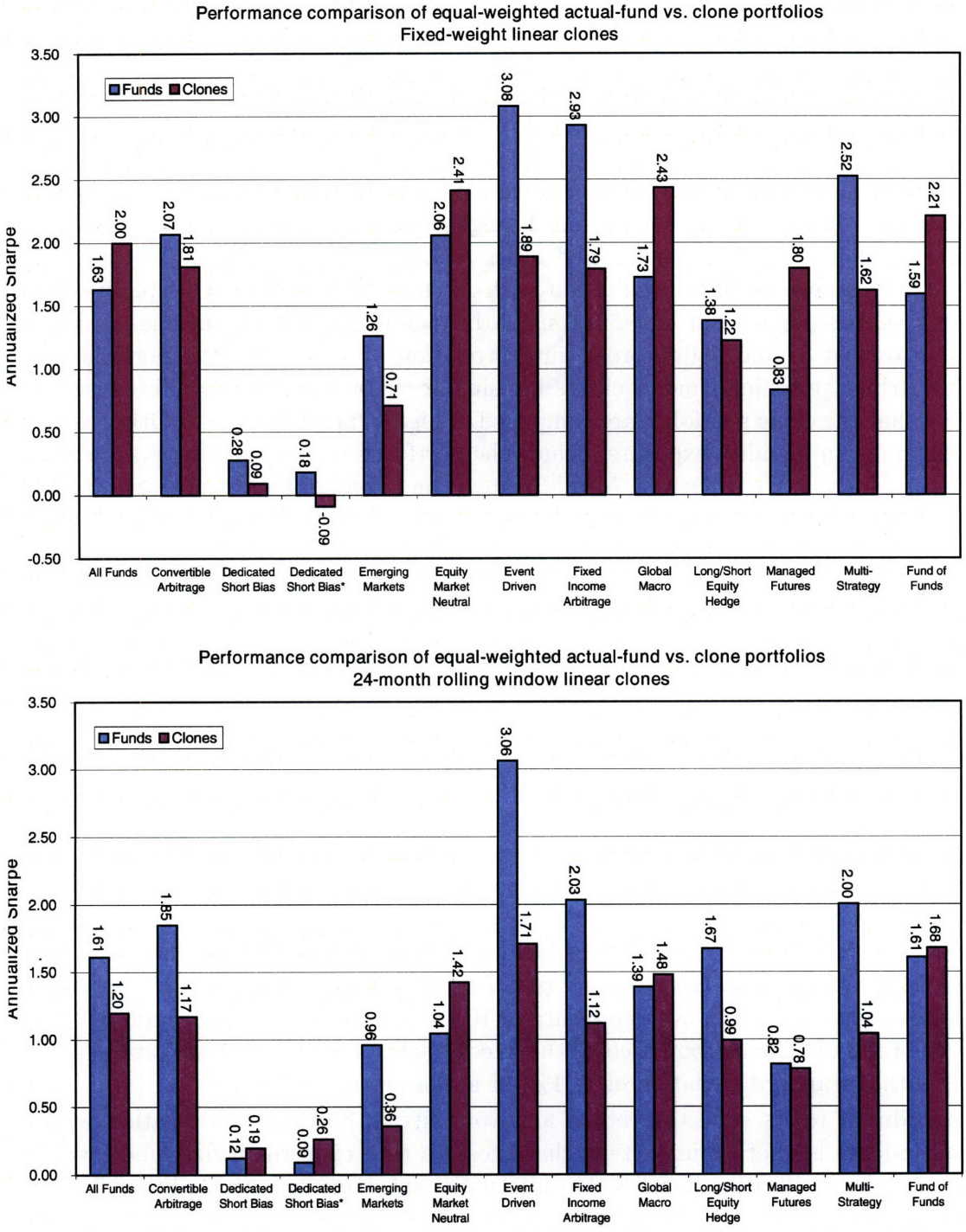

Figure 2-6: Comparison of Sharpe ratios of equal-weighted portfolios of funds versus fixed-weight and 24-month rolling-window linear clones of hedge funds in the TASS Live database, from February 1986 to September 2005.

Convertible Arbitrage funds in the fixed-weight sample has a 48% correlation to the S&P 500, a −29% correlation to 3-month LIBOR, a 6% correlation to the U.S. Dollar Index, and a 79% correlation to the CSFB/Tremont Convertible Arbitrage Index. In comparison, the portfolio of Convertible Arbitrage fixed-weight clones has a 63% correlation to the S&P 500, a −35% correlation to 3-month LIBOR, a 1% correlation to the U.S. Dollar Index, and a 37% correlation to the CSFB/Tremont Convertible Arbitrage Index.

However, some differences do exist. The equal-weighted portfolios of funds tend to have higher correlation with the corresponding CSFB/Tremont Hedge-Fund Index of the same category than the equal-weighted portfolios of both types of clones. For example, the correlation between the portfolio of funds and the CSFB/Tremont Hedge-Fund Index in the fixed-weight sample is 82%, and the corresponding correlation for the portfolio of fixed-weight clones with the same index is 56%, and the same pair of correlations for the rolling-window case is 83% and 56%, respectively. This pattern is repeated in every single category for both types of clones, and is not unexpected given that the CSFB/Tremont indexes are constructed from the funds themselves. On the other hand, the portfolios of clones are sometimes more highly correlated with certain indexes than their fund counterparts because of how the clones are constructed. For example, the correlation of the portfolio of Equity Market Neutral fixed-weight clones with the BOND factor is 67%, whereas the correlation of the portfolio of corresponding Equity Market Neutral funds is only 11%. This difference is likely the result of the fact that the BOND factor is one of the five factors used to construct clone returns, so the correlations of clone portfolios to these factors will typically be larger in absolute value than those of the corresponding fund portfolios.

A summary of the differences in correlation properties between funds and clones is provided by Table 2.11. The first column in each of the two sub-panels labelled "% Same Sign" contains the percentage of the 28 market-index correlations in Tables 2.9 and 2.10, respectively, for which the fund correlation and the clone correlation are of the same sign. The next two columns of each sub-panel contain the mean and standard deviation of the absolute differences in fund- and clone-correlation across the 28 market-index correlations. These results show remarkable agreement in sign for both fixed-weight and rolling-window clones, ranging from 71% to 100%, and mean absolute-differences ranging from 9% to 23%. And even for the largest mean-absolute-difference of 23% (fixed-weight clones in the Fund of Funds category), 89% of the correlations exhibit the same sign in this category.

Overall, the results in Tables 2.9–2.11 show that the correlations of clone portfolios are generally comparable in sign and magnitude to those of the fund portfolios, implying that portfolios of clones can provide some of the same diversification benefits as their hedge-fund counterparts.

$\text{Index}_{t-1})/\text{Index}_t$), with no accounting for any distributions. The SP500 factor does include dividends, and the DVIX factor is the first difference of the month-end VIX index.

Category	Fixed-Weight Linear Clones			Rolling-Window Linear Clones		
	% Same Sign	Mean $\lvert\rho_f-\rho_c\rvert$	SD $\lvert\rho_f-\rho_c\rvert$	% Same Sign	Mean $\lvert\rho_f-\rho_c\rvert$	SD $\lvert\rho_f-\rho_c\rvert$
All Funds	86	19	11	93	12	7
Convertible Arbitrage	100	12	10	93	12	10
Dedicated Short Bias	93	13	7	89	19	13
Emerging Markets	79	19	12	86	10	9
Equity Market Neutral	86	19	13	96	12	10
Event Driven	89	12	10	86	11	6
Fixed Income Arbitrage	86	13	13	71	14	13
Global Macro	100	20	17	93	10	7
Long/Short Equity Hedge	89	11	6	96	10	6
Managed Futures	96	15	20	96	9	11
Multi-Strategy	93	14	10	93	12	6
Fund of Funds	89	23	11	96	13	9

Table 2.11: Comparison of signs and absolute differences of correlations of funds and clones to 28 market indexes, where fixed-weight and 24-month rolling-window linear clones are constructed from hedge funds in the TASS Live database, from February 1986 to September 2005.

2.5 Conclusion

A portion of every hedge fund's expected return is risk premia—compensation to investors for bearing certain risks. One of the most important benefits of hedge-fund investments is the non-traditional types of risks they encompass, such as tail risk, liquidity risk, and credit risk. Most investors would do well to take on small amounts of such risks if they are not already doing so because these factors usually yield attractive risk premia, and many of these risks are not highly correlated with those of traditional long-only investments. Although talented hedge-fund managers are always likely to outperform passive fixed-weight portfolios, the challenges of manager selection and monitoring, the lack of transparency, the limited capacity of such managers, and the high fees may tip the scales for the institutional investor in favor of clone portfolios. In such circumstances, portable beta may be a reasonable alternative to portable alpha.

Our empirical findings suggest that the possibility of cloning hedge-fund returns is real. For certain hedge-fund categories, the average performance of clones is comparable—on both a raw-return and a risk-adjusted basis—to their hedge-fund counterparts. For other categories like Event Driven and Emerging Markets, the clones are less successful.

The differences in performance of clones across hedge-fund categories raises an important philosophical issue: What is the source of the clones' value-added? One possible interpretation is that the cloning process "reverse-engineers" a hedge fund's proprietary trading strategy, thereby profiting from the fund's intellectual property. Two assumptions underlie

this interpretation, both of which are rather unlikely: (1) it is possible to reverse-engineer a hedge fund's strategy using a linear regression of its monthly returns on a small number of market-index returns; and (2) all hedge funds possess intellectual property worth reverse-engineering. Given the active nature and complexity of most hedge-fund strategies, it is hard to imagine reverse-engineering them by regressing their monthly returns on five factors. However, if such strategies have risk factors in common, it is not hard to imagine identifying them by averaging a reasonable cross-section of time-series regressions of monthly returns on those risk factors. As for whether all hedge funds have intellectual property worth reverse-engineering, we have purposely included *all* the TASS hedge funds in our sample—not just the successful ones—and it is unlikely that all of the 1,610 funds possess significant manager-specific alpha. In fact, for our purposes, the main attraction of this sample of hedge funds is the funds' beta exposures.

Our interpretation of the clones' value-added is less devious: By analyzing the monthly returns of a large cross-section of hedge funds (some of which have genuine manager-specific alpha, and others which do not), it is possible to identify common risk factors from which those funds earn part, but not necessarily all, of their expected returns. By taking similar risk exposures, it should be possible to earn similar risk premia from those exposures, hence at least part of the hedge funds' expected returns can be attained, but in a lower-cost, transparent, scalable, and liquid manner.

As encouraging as our empirical results may seem, a number of qualifications should be kept in mind. First, we observed a significant performance difference between fixed-weight and rolling-window clones, and this gap must be weighed carefully in any practical implementation of the cloning process. The fixed-weight approach yields better historical performance and lower turnover, but is subject to look-ahead bias so the performance may not be achievable out-of-sample. The rolling-window approach yields less attractive historical performance, but the simulated performance may be more attainable, and the flexibility of rolling-window estimators may be critical for capturing nonstationarities such as time-varying means, volatilities, and regime changes. The costs and benefits of each approach must be evaluated on a case-by-case basis with the specific objectives and constraints of the investor in mind.

Second, despite the promising properties of linear clones in several style categories, it is well-known that certain hedge-fund strategies contain inherent nonlinearities that cannot be captured by linear models (see, for example, Capital Multiplication Partners). Therefore, more sophisticated nonlinear methods—including nonlinear regression, regime switching processes, stochastic volatility models, and Kat and Palaro's (2005) copula-based algorithm—may yield significant benefits in terms of performance and goodness-of-fit. However, there is an important trade-off between the goodness-of-fit and complexity of the replication process, and this trade-off varies from one investor to the next. As more sophisticated replication methods are used, the resulting clone becomes less passive, requiring more trading and risk-management expertise, and eventually becoming as dynamic and complex as the hedge-fund strategy itself.

Third, the replicating factors we proposed are only a small subset of the many liquid

instruments that are available to the institutional investor. By expanding the universe of factors to include options and other derivative securities, and customizing the set of factors to each hedge-fund category (and perhaps to each fund), it should be possible to achieve additional improvements in performance, including the ability to capture tail risk and other nonlinearities in a fixed-weight portfolio. In fact, Haugh and Lo (2001) show that a judiciously constructed fixed-weight portfolio of simple put and call options can yield an excellent approximation to certain dynamic trading strategies, and this approach can be adopted in our context to create better clones.

Finally, we have not incorporated any transactions costs or other frictions into our performance analysis of the clone portfolios, which will clearly have an impact on performance. The more passive clones will be less costly to implement, but they may not capture as many risk exposures and nonlinearities as the more sophisticated versions. However, by construction, clones will have a significant cost advantage over a traditional fund of funds investment, not only because of the extra layer of fees that funds of funds typically charge, but also because of the clone portfolio's more efficient use of capital due to the cross-netting of margin requirements and incentive fees. For example, consider a fund of funds with equal allocations to two managers, each of which charges a 2% management fee and a 20% incentive fee, and suppose that in a given year, one manager generates a 25% return and the other manager loses 5%. Assuming a 1% management fee and a 10% incentive fee for the fund of funds, and no loss carryforwards for the underlying funds from previous years, this scenario yields a net return of only 4.05% for the fund of funds investors. In this case, the fees paid by the investors amount to a stunning 59.5% of the net profits generated by the underlying hedge funds.

Of course, a number of implementation issues remain to be resolved before hedge-fund clones become a reality, e.g., the estimation methods for computing clone portfolio weights, the implications of the implied leverage required by our renormalization process, the optimal rebalancing interval, the types of strategies to be cloned, and the best method for combining clones into a single portfolio. We are cautiously optimistic that the promise of our initial findings will provide sufficient motivation to take on these practical challenges.

2.6 Appendix

The following is a list of category descriptions, taken directly from TASS documentation, that define the criteria used by TASS in assigning funds in their database to one of 11 possible categories:

Convertible Arbitrage This strategy is identified by hedge investing in the convertible securities of a company. A typical investment is to be long the convertible bond and short the common stock of the same company. Positions are designed to generate profits from the fixed income security as well as the short sale of stock, while protecting principal from market moves.

Dedicated Short Bias Dedicated short sellers were once a robust category of hedge funds before the long bull market rendered the strategy difficult to implement. A new category, short biased, has emerged. The strategy is to maintain net short as opposed to pure short exposure. Short biased managers take short positions in mostly equities and derivatives. The short bias of a manager's portfolio must be constantly greater than zero to be classified in this category.

Emerging Markets This strategy involves equity or fixed income investing in emerging markets around the world. Because many emerging markets do not allow short selling, nor offer viable futures or other derivative products with which to hedge, emerging market investing often employs a long-only strategy.

Equity Market Neutral This investment strategy is designed to exploit equity market inefficiencies and usually involves being simultaneously long and short matched equity portfolios of the same size within a country. Market neutral portfolios are designed to be either beta or currency neutral, or both. Well-designed portfolios typically control for industry, sector, market capitalization, and other exposures. Leverage is often applied to enhance returns.

Event Driven This strategy is defined as 'special situations' investing designed to capture price movement generated by a significant pending corporate event such as a merger, corporate restructuring, liquidation, bankruptcy, or reorganization. There are three popular sub-categories in event-driven strategies: risk (merger) arbitrage, distressed/high yield securities, and Regulation D.

Fixed Income Arbitrage The fixed income arbitrageur aims to profit from price anomalies between related interest rate securities. Most managers trade globally with a goal of generating steady returns with low volatility. This category includes interest rate swap arbitrage, U.S. and non-U.S. government bond arbitrage, forward yield curve arbitrage, and mortgage-backed securities arbitrage. The mortgage-backed market is primarily U.S.-based, over-the-counter, and particularly complex.

Global Macro Global macro managers carry long and short positions in any of the world's major capital or derivative markets. These positions reflect their views on overall market direction as influenced by major economic trends and/or events. The portfolios of these funds can include stocks, bonds, currencies, and commodities in the form of cash or derivatives instruments. Most funds invest globally in both developed and emerging markets.

Long/Short Equity Hedge This directional strategy involves equity-oriented investing on both the long and short sides of the market. The objective is not to be market neutral. Managers have the ability to shift from value to growth, from small to medium to large capitalization stocks, and from a net long position to a net short position. Managers may use futures and options to hedge. The focus may be regional, such as long/short U.S. or European equity, or sector specific, such as long and short technology or healthcare stocks. Long/short equity funds tend to build and hold portfolios that are substantially more concentrated than those of traditional stock funds.

Managed Futures This strategy invests in listed financial and commodity futures markets and currency markets around the world. The managers are usually referred to as Commodity Trading Advisors, or CTAs. Trading disciplines are generally systematic or discretionary. Systematic traders tend to use price and market specific information (often technical) to make trading decisions, while discretionary managers use a judgmental approach.

Multi-Strategy The funds in this category are characterized by their ability to dynamically allocate capital among strategies falling within several traditional hedge-fund disciplines. The use of many strategies, and the ability to reallocate capital between them in response to market opportunities, means that such funds are not easily assigned to any traditional category.

The Multi-Strategy category also includes funds employing unique strategies that do not fall under any of the other descriptions.

Fund of Funds A 'Multi Manager' fund will employ the services of two or more trading advisors or Hedge Funds who will be allocated cash by the Trading Manager to trade on behalf of the fund.

Chapter 3

Automating Technical Analysis Via Neural Networks

3.1 Introduction

The idea that stock market prices follow a random walk was first anticipated more than a century ago by the French graduate student Louis Bachelier (1870-1946) in his 1900 doctoral dissertation, *Théorie de la Spéculation.*[1] Unfortunately, the dissertation, now deemed the "origin of mathematical finance," fell into oblivion [27, p. 344]. Fifty-three years later, a British statistician by the name of Maurice G. Kendall presented a paper, *The Analysis of Economic Time-Series – Part I: Prices*, to the Royal Statistical Society, in which he insisted that "there [was] no hope of being able to predict movements on the exchange for a week ahead without extraneous information" [62, p. 11]. Rather, it was "almost as if once a week the Demon of Chance drew a random number from a symmetrical population of fixed dispersion and added it to the current price to determine the next week's price" [62, p. 13]. It is from this rediscovery that the Random Walk Hypothesis stems [11, p. 354].

A great deal of research has been devoted to testing empirically the Random Walk Hypothesis ever since, and much of it turned out in its favor, especially early on. For example, in their important study, Fama and Blume (1966) investigate whether one can exploit the degree of dependence between successive price changes of individual securities by following a mechanical trading rule. The trading rule they consider is known as Alexander's filter technique, and they measure its profitability by comparing its expected returns to those of a passive buy-and-hold strategy. They conclude that the trading strategy they consider does not provide any value added and that, even from an investor's viewpoint, the random-walk model is an adequate description of the price behavior. Such conclusion rules out the possibility that technical analysts – or chartists, as they are popularly known – whose principal assumption is that past prices contain information for predicting future returns, can add

[1]See Bachelier, L. *Théorie de la Spéculation.* Gauthiers-Villars, Paris: 1900. Translated into English by A.J. Boness in Cootner, P.H. (ed.). *Random Character of Stock Market Prices.* MIT Press, Cambridge: 1964.

value to the investment process. Consequently, technical analysis has been largely discredited in the academic world, with Burton G. Malkiel, the author of the influential *A Random Walk Down Wall Street* (1996), concluding that "under scientific scrutiny, chart-reading must share a pedestal with alchemy."

Though to this day many academics remain critical of the discipline, an increasing number of studies suggests, either directly or indirectly, that "technical analysis may well be an effective means for extracting useful information from market prices" [73, p. 1705]. First of all, there has been a recognition among finance academics that a random walk is not an adequate model of reality, which has opened the doors for academic considerations of technical analysis. An early though in its time largely ignored study is that by Granger and Morgenstern (1963), who find that the random walk model ignores the possibly important low-frequency (long-run) components of the time series of stock market prices. More recently, Treynor and Ferguson (1983) show that it is not only the past prices, but the past prices plus some valuable nonpublic information, that can lead to profit. Lo and MacKinlay (1988) strongly reject the Random Walk Hypothesis for weekly stock market returns by using a simple volatility-based specification test.

This rejection of the Random Walk Hypothesis has paved the way for more direct studies of the validity of technical analysis. For example, Pruitt and White (1988) test the performance of a multi-component technical trading system, and conclude that it does better than a simple buy-and-hold strategy to an extent that could not be attributed to chance alone. Brock, Lakonishok, and LeBaron (1992) find that the moving average and the trading range-break technical indicators do posses some predictive power, and that the returns that they generate are unlikely to be generated by the four popular null models (a random walk with drift, AR(1), GARCH-M, and EGARCH). Chang and Osler (1994) suggest that the head-and-shoulders pattern has some predictive power in foreign exchange markets. Using genetic programming to investigate whether optimal trading rules can be revealed by the data themselves, Neely, Weller, and Dittmar (1997) discover strong evidence of economically significant out-of-sample excess returns after the adjustment for transaction costs for the exchange rates under consideration. Brown and Goetzmann (1998) reevaluate Alfred Cowles' (1934) test of the Dow Theory (as interpreted by Hamilton),[2] and conclude that the Hamilton strategy can reduce portfolio volatility and yield profits that are higher than those of the buy-and-hold. Allen and Karjalainen (1999) use genetic programming to discover optimal trading rules for the S&P 500 Index, and find that their rules do exhibit some forecasting power. Lo, Mamaysky, and Wang (2000) find that certain technical patterns, when applied to many stocks over many time periods, do provide useful information, especially for Nasdaq stocks; it is their work that becomes the focal point of the technical analysis portion of this thesis.

[2]Cowles' (1934) test provided "strong evidence" against the ability of the Dow Theory to forecast stock market prices.

3.2 Objectives and Outline

In their 2000 paper, *Foundations of Technical Analysis*, Lo, Mamaysky, and Wang propose a novel pattern recognition algorithm which extracts nonlinear patterns from the noisy price data. Their algorithm is based on a smoothing estimator known as kernel regression which estimates nonlinear relationships by averaging the data in sophisticated ways to reduce the observational errors. Developing such an algorithm is in itself useful, as it is a step towards the automation of technical analysis. In this thesis, we propose an analogous algorithm based on neural networks, which in the light of the flexibility of neural network models and given the extent of parallel processing that they allow, constitutes a step forward in the automation of technical analysis. We then apply our neural network based model in the same way Lo, Mamaysky, and Wang apply their kernel regression based one, that is, to investigate the ability of technical trading patterns to forecast future price moves. To address the lack of standardization of technical analysis (there is no single universally accepted definition of technical patterns), for each pattern, we consider its three commonly used variants. This allows us to evaluate the robustness of Lo, Mamaysky, and Wang's results, and examine whether they really are the consequence of the efficacy of technical analysis, rather than an artifact of their particular choice of pattern definitions or of their kernel regression model. In other words, if the conclusions of the said authors are due to the ability of technical indicators to capture some underlying properties of the financial time series, thus validating technical analysis, then our conclusions should match theirs.

3.3 Automating Technical Analysis: A Pattern Recognition Algorithm

Our pattern recognition algorithm consists of three parts:

1. Constructing a neural network model of a given time series of prices,
2. Defining technical patterns quantitatively, in terms of their geometric properties, and
3. Scanning the neural network model for the presence of technical patterns.

Each of these parts will be dealt with in turn in the following sections.

3.3.1 A neural network model

As Lo, Mamaysky, and Wang point out, at the heart of technical analysis is the recognition that prices evolve in a nonlinear fashion over time, but that this evolution is not random and that it contains certain regularities or patterns. More precisely, we can say that a time series of prices is a sum of a nonlinear pattern and white noise, namely

$$P_t = m(X_t) + \varepsilon_t, \ t = 1, 2, ..., T \tag{3.1}$$

where $m(X_t)$ is an arbitrary fixed but unknown nonlinear function of a state variable X_t and $\{\varepsilon_t\}$ is white noise. [73, p. 1708]

However, before we can examine the significance of the information content of technical patterns, we must be able to identify, or extract, these patterns from the nonlinear time series of prices. Here it is important to realize that identifying patterns from the raw price data directly would not be sensible. As Lo, Mamaysky, and Wang put it, such approach "identifies too many extrema and also yields patterns that are not visually consistent with the kind of patterns that technical analysts find compelling" [73, p. 1720]. When professional technicians study a price chart, their eyes naturally smooth the data, while their cognition discerns regularities. Moreover, many would argue that much of this process takes place on an intuitive and subconscious level, making it even harder to quantify.

Logical first candidates for modelling a process by which technicians look for patterns in a price chart are smoothing estimators, since, as Lo, Mamaysky, and Wang explain, "smoothing estimators are motivated by their close correspondence to the way human cognition extracts regularities from noisy data" [73, p. 1709]. In this regard a neural network seems to be particularly suitable, since the motivation for it comes directly from the human brain. Just like the brain is a network formed by interconnections of biological neurons, an artificial neural net is formed by interconnections of artificial neurons. The structure of an artificial neuron is similar to that of its biological counterpart. A biological neuron accepts different input signals through dendrites, combines them in its body, or soma, and outputs them through the axon. Similarly, an artificial neuron accepts different input signals, weights them, sums them, and outputs the resulting signal through a transformation γ. When we say that an artificial neural network "learns," we mean that its weights undergo training and adaptation. The weights themselves constitute the memory of the system, and determine the behavior of the network. They can be trained by various algorithms to approximate functions and lead to "intelligent" behavior. [83]

More formally, suppose that there exists a set of inputs that belong to a set $U \subset \mathcal{R}^p$ and a corresponding set of outputs that belong to a set $V \subset \mathcal{R}^m$, and let $f : \mathcal{R}^p \to \mathcal{R}^m$ be a mapping between an input space and an output space. Our task is to use input and output data to approximate this mapping. In particular, let $f : \mathcal{R}^p \to \mathcal{R}^m$, an unknown function to be approximated, be defined by a finite set of input-output pairs $\{u^{(i)}, v^{(i)}\}$, so that $f[u^{(i)}] = v^{(i)}$. Let $F(\theta) : \mathcal{R}^p \to \mathcal{R}^m$ be a parameterized function corresponding to a neural network, where $\theta = [\theta_1, \theta_2, ..., \theta_N]^T$ is a parameter vector of dimension N. Our task is to determine θ^* based on the available data in such a way that would make $F(\theta^*)$ the "best" possible approximation to f. [83] One way to accomplish this is to choose θ such that the sum of squared errors between the target and the network output is minimized. This method of estimating the parameters is known as nonlinear least squares, and is preferred to other methods, such as backpropagation, due to its many practical advantages.[3]

Recall that in the particular case of our problem we have $P_t = m(X_t) + \varepsilon_t$, $t = 1, ..., T$, where $m : \mathcal{R} \to \mathcal{R}$, and where $\{X_j\}$ is the input sequence and $\{P_j\}$ is the target sequence. The input sequence $\{X_j\}$ is chosen to be the time with increments of 0.1, namely $\{X_j\} =$

[3]See [19], [112].

$\{1, 1.1, 1.2, ..., T\}$. Our objective is to approximate m by a neural network model $\hat{m}$. We choose a simple model, a neural network with one hidden layer (also known as a multilayer percepteron with one hidden layer), which, despite its simplicity, possesses the universal approximation property,[4] and is capable of capturing a variety of nonlinearities [71, p. 30]. In particular, we let

$$\hat{m}(X_t; \theta) = \Theta[v_0 + \sum_{i=1}^{n} v_i \Gamma(w_{i0} + w_{i1} X_t)] \tag{3.2}$$

be a neural network representation, where there are only two inputs, X_t and 1, where $\Gamma(\cdot) = \text{htan}(\cdot)$ is the nonliear activation function that is associated with the nodes in the hidden layer, where the activation function $\Theta(\cdot)$ for the output layer is assumed to be the identity function, and where $v_0, ..., v_n, w_{10}, ..., w_{n0}, w_{11}, ..., w_{n1}$ are the $3n+1$ parameters that need to be adjusted so that $\hat{m}$ is a good approximation to m.

We then let

$$\theta^T = [v_0, ..., v_n, w_{10}, ..., w_{n0}, w_{11}, ..., w_{n1}] \tag{3.3}$$

be the parameter vector, and solve

$$\min_\theta \sum_{\tau=1}^{t} [P_t - \hat{m}(X_\tau; \theta)]^2 \tag{3.4}$$

using nonlinear least squares. Specifically, we use the *lmtrain* Matlab function, which uses the Levenberg-Marquardt algorithm to solve the above-stated nonlinear optimization problem.

Selecting the number of nodes Recall that one of our main objectives in using a neural network model is to be able to replicate, at least in part, the kind of smoothing that professional technical analysts are doing with their eyes and their cognition when they look at the price chart. Central to our success in this matter is the selection of an appropriate number of nodes in the hidden layer, since it is the number of nodes that determines the level of smoothing, through an inverse relationship. We base our model selection on the interviews with three professional technical analysts.[5] These technicians were presented with a slide show of charts depicting neural network approximations on top of the raw price data, where each chart contained the same raw data but where the number of nodes in the hidden layer of a neural network was increasing progressively. When the said technicians were asked to choose the models that they considered the "best" for the purpose at hand, they opted for

[4] See [112].

[5] We thank Mike Epstein, Peter Gallagher, and Richard Gula.

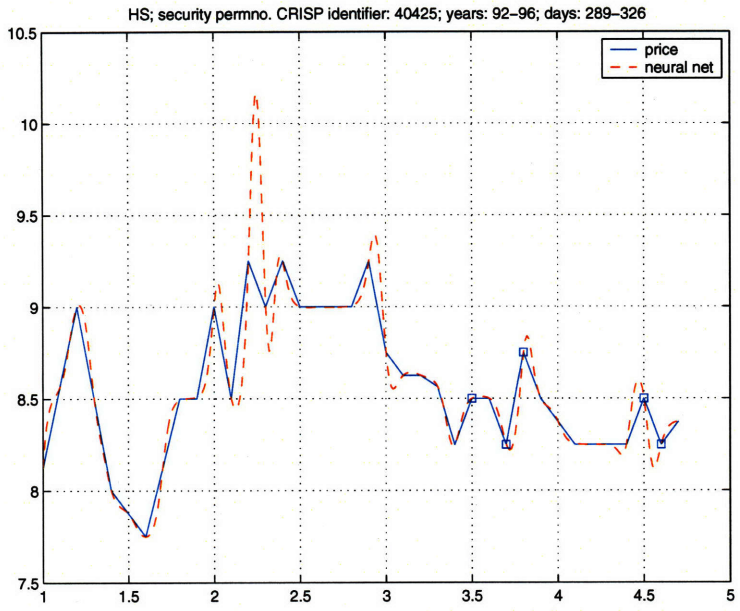

Figure 3-1: Lower Degree of Smoothing Case: Head-and-Shoulders Example

those characterized by a relatively low degree of smoothing, with the number of nodes ranging from 18 to 35 across stocks.[6] Note that, while using such a large number of nodes in an economic forecasting application would be unreasonable, it is entirely sensible in the context of our pattern recognition problem. Finally, the robustness of the results is investigated by implementing neural network models characterized by a higher degree of smoothing, with the number of nodes ranging from 7 to 18 across stocks. Please see Figures 1-20 for illustration.

[6]When the numbers that they chose did not coincide, the median number of nodes was implemented.

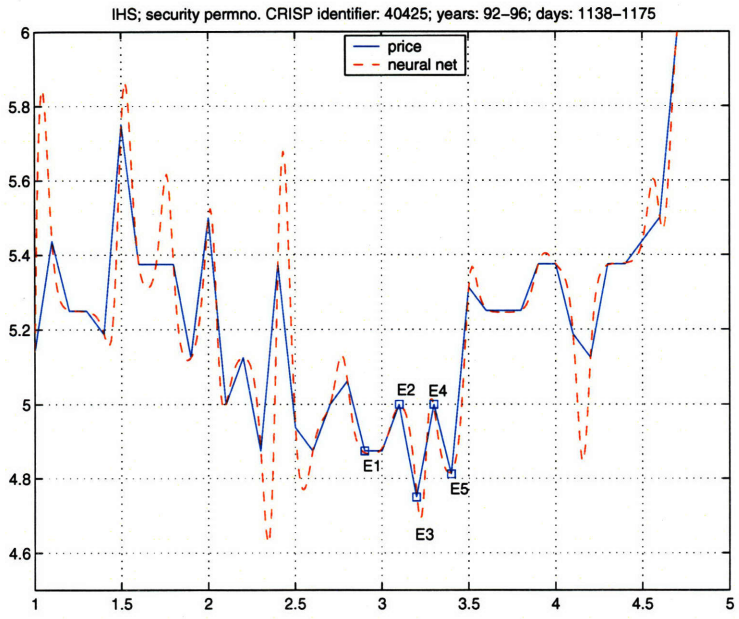

Figure 3-2: Lower Degree of Smoothing Case: Inverse Head-and-Shoulders Example

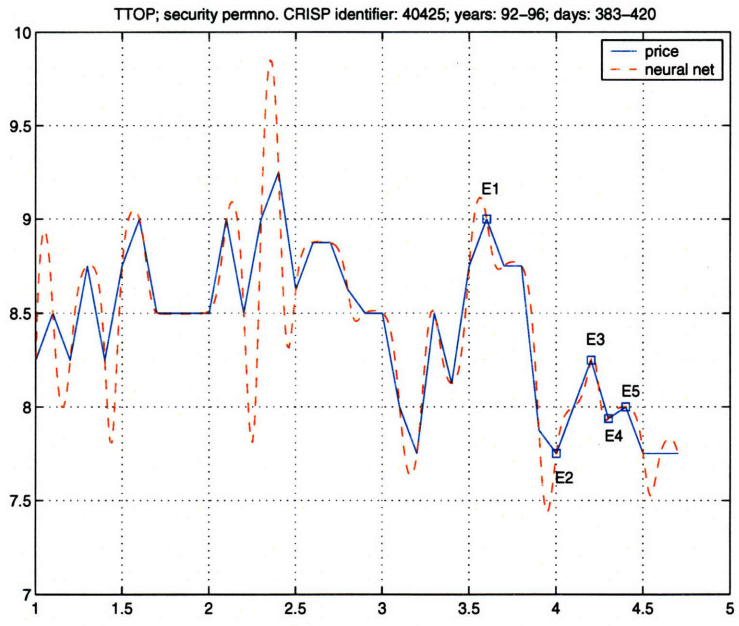

Figure 3-3: Lower Degree of Smoothing Case: Triangle Top Example

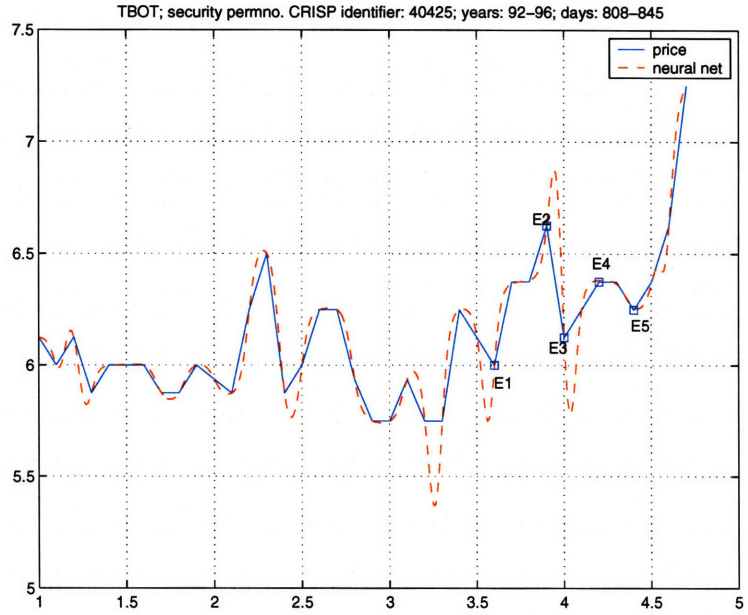

Figure 3-4: Lower Degree of Smoothing Case: Triangle Bottom Example

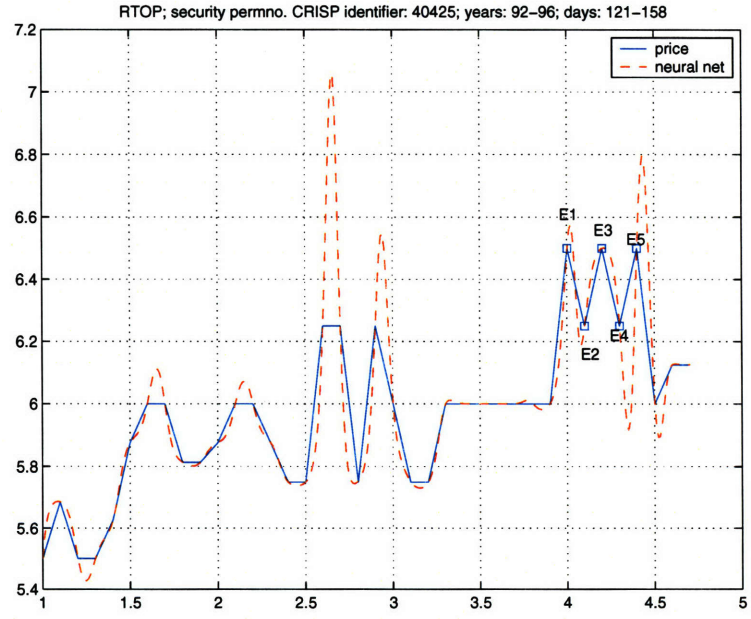

Figure 3-5: Lower Degree of Smoothing Case: Rectangle Top Example

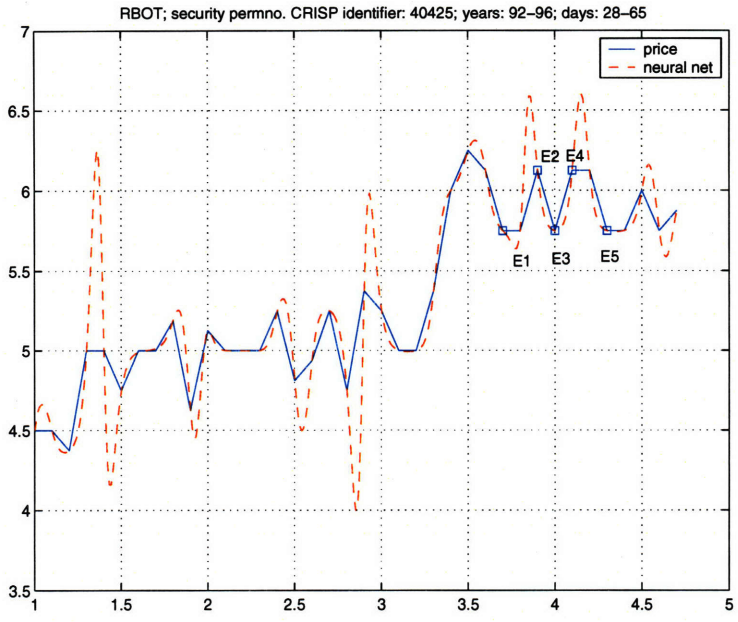

Figure 3-6: Lower Degree of Smoothing Case: Rectangle Bottom Example

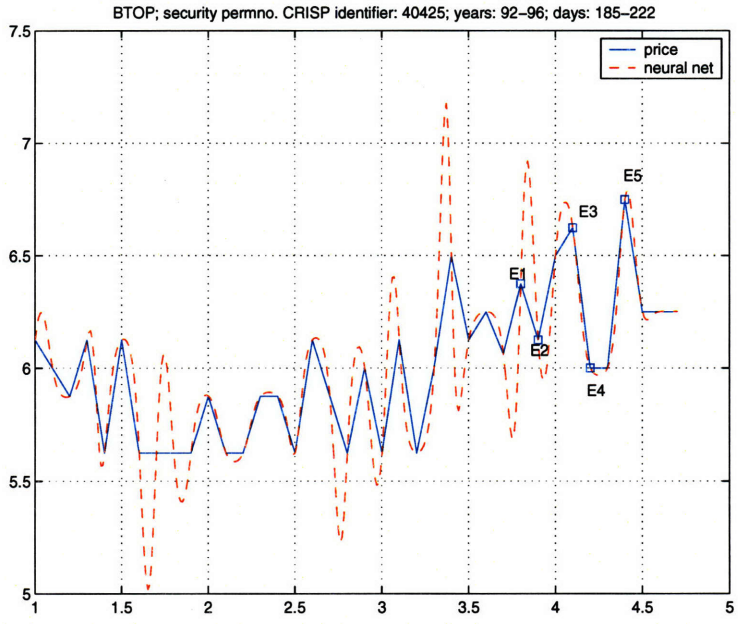

Figure 3-7: Lower Degree of Smoothing Case: Broadening Top Example

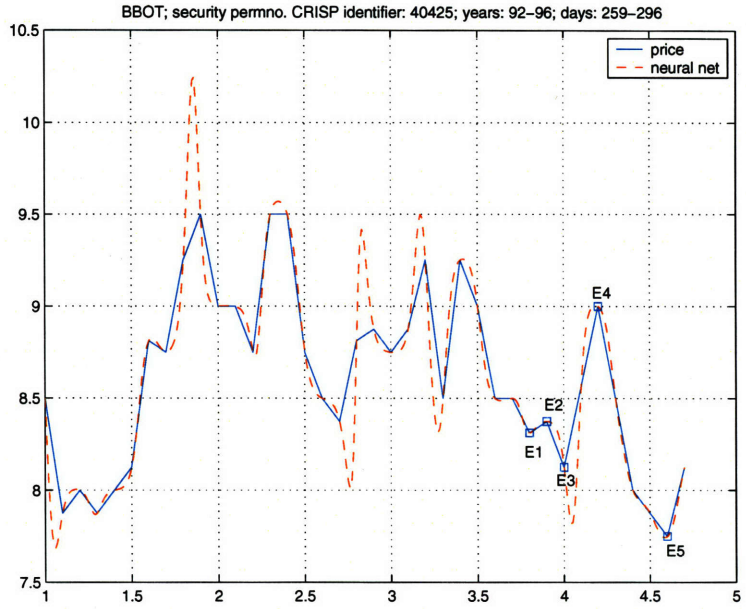

Figure 3-8: Lower Degree of Smoothing Case: Broadening Bottom Example

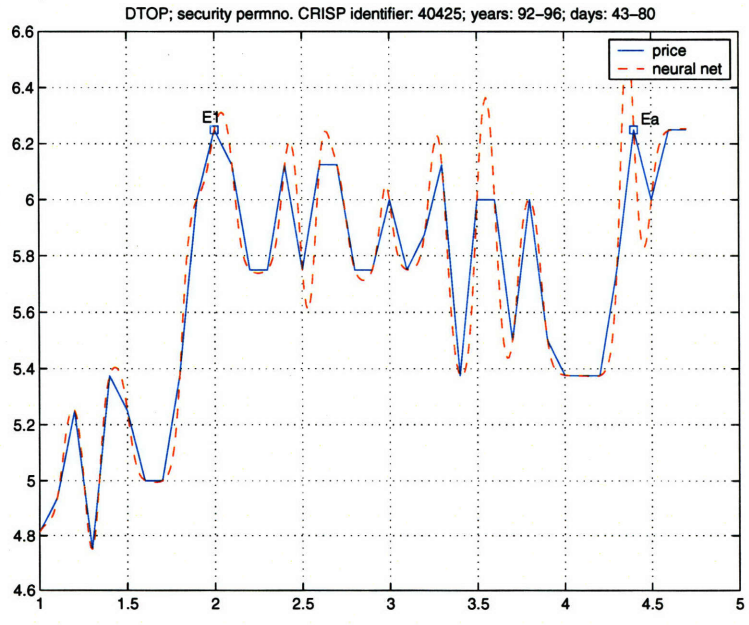

Figure 3-9: Lower Degree of Smoothing Case: Double Top Example

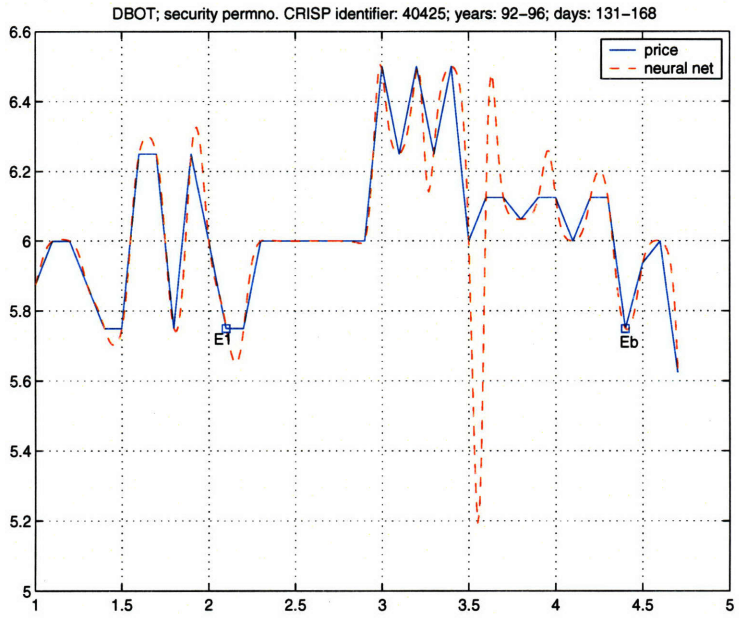

Figure 3-10: Lower Degree of Smoothing Case: Double Bottom Example

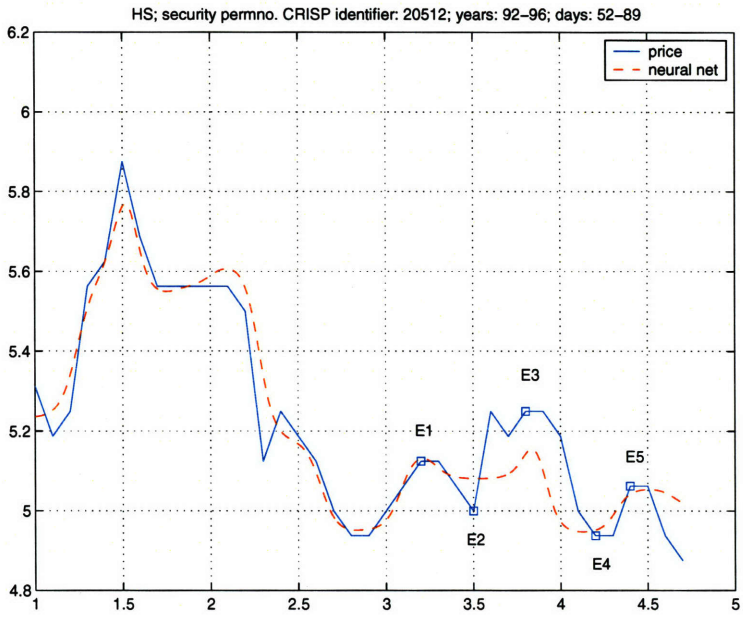

Figure 3-11: Higher Degree of Smoothing Case: Head-and-Shoulders Example

3.3.2 Defining technical patterns quantitatively

Before the scanning of the above-described neural network models for the presence of technical patterns can be automated, pattern definitions, presented in non-mathematical language in the technical analysis literature, must be quantified. Following Lo, Mamaysky, and Wang, we consider the ten most commonly used patterns:[7] head-and-shoulders (HS) and inverse head-and-shoulders (IHS), triangle top (TTOP) and bottom (TBOT), rectangle top (RTOP) and bottom (RBOT), broadening top (BTOP) and bottom (BBOT), and double top (DTOP) and bottom (DBOT). We start by summarizing the quantitative versions of the pattern definitions provided by Lo, Mamaysky, and Wang,[8] then proceed to augment these definitions by introducing the concept of a neckline.

Head-and-Shoulders is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a maximum
- $E_3 > E_1$, $E_3 > E_5$
- E_1 and E_5 are within 1.5 percent of their average
- E_2 and E_4 are within 1.5 percent of their average

[7] See, e.g., [82] or [34].
[8] Please see [73, pp. 1716-1718].

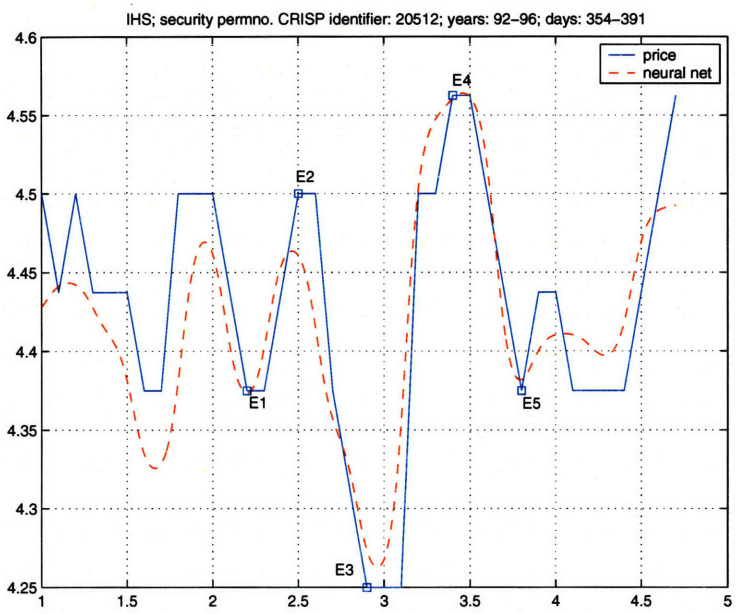

Figure 3-12: Higher Degree of Smoothing Case: Inverse Head-and-Shoulders Example

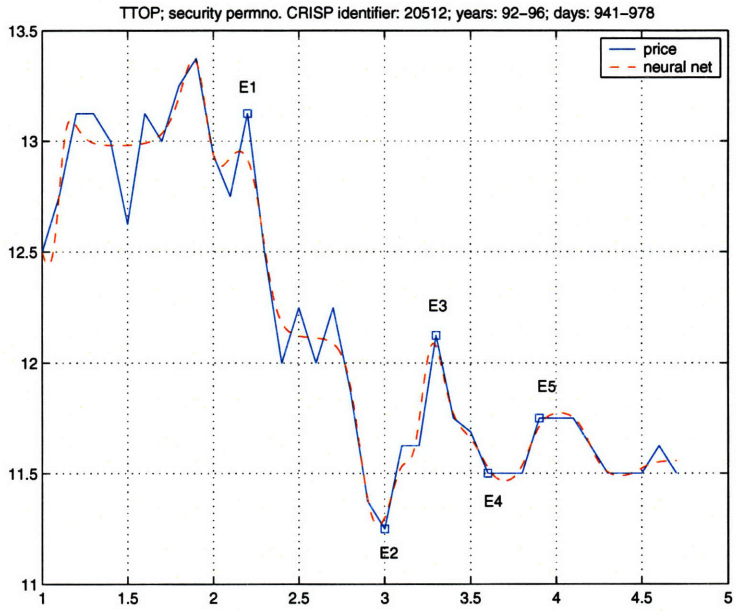

Figure 3-13: Higher Degree of Smoothing Case: Triangle Top Example

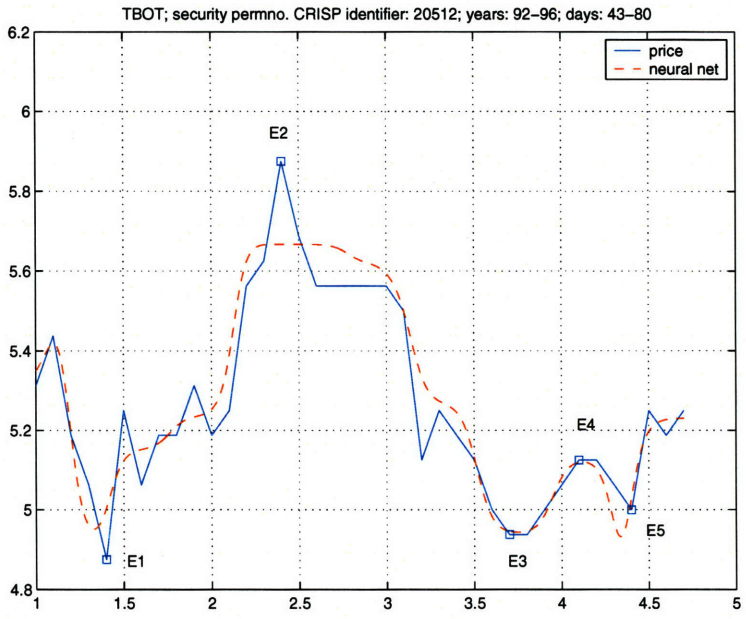

Figure 3-14: Higher Degree of Smoothing Case: Triangle Bottom Example

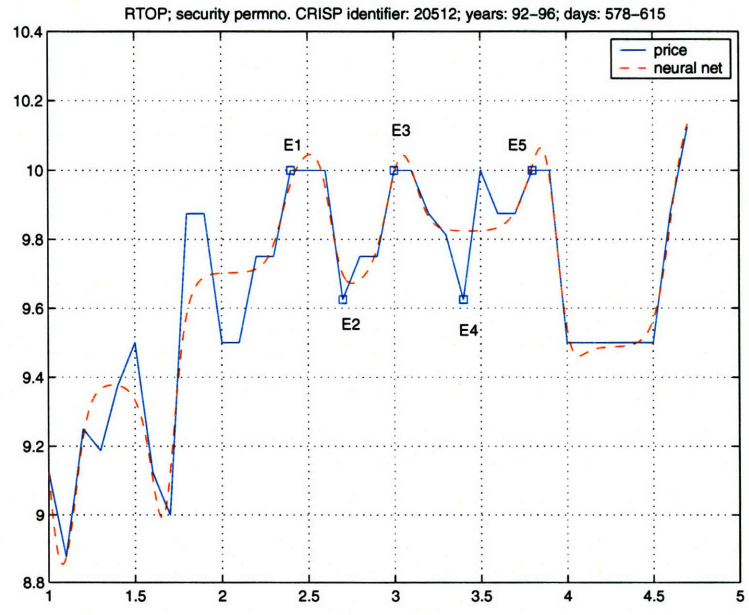

Figure 3-15: Higher Degree of Smoothing Case: Rectangle Top Example

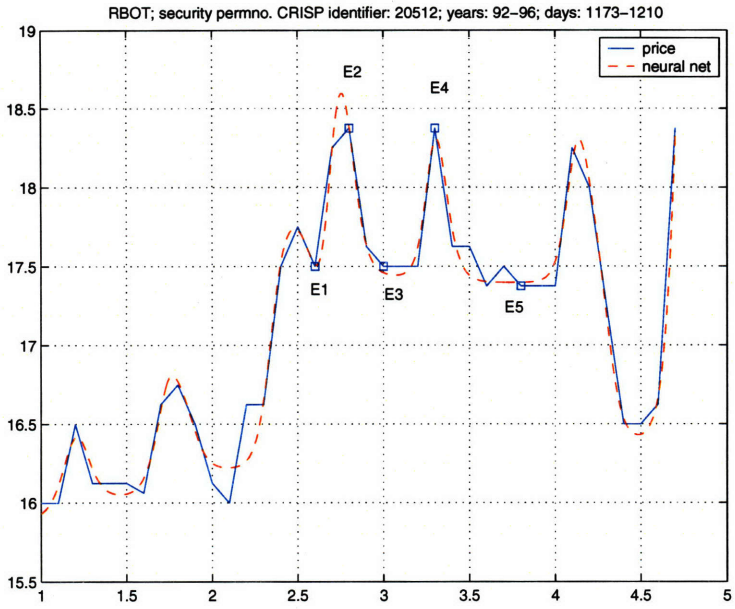

Figure 3-16: Higher Degree of Smoothing Case: Rectangle Bottom Example

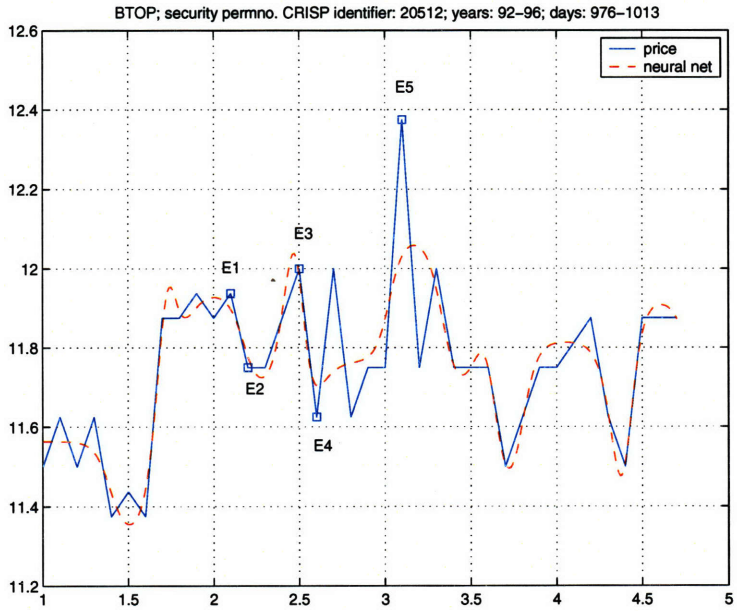

Figure 3-17: Higher Degree of Smoothing Case: Broadening Top Example

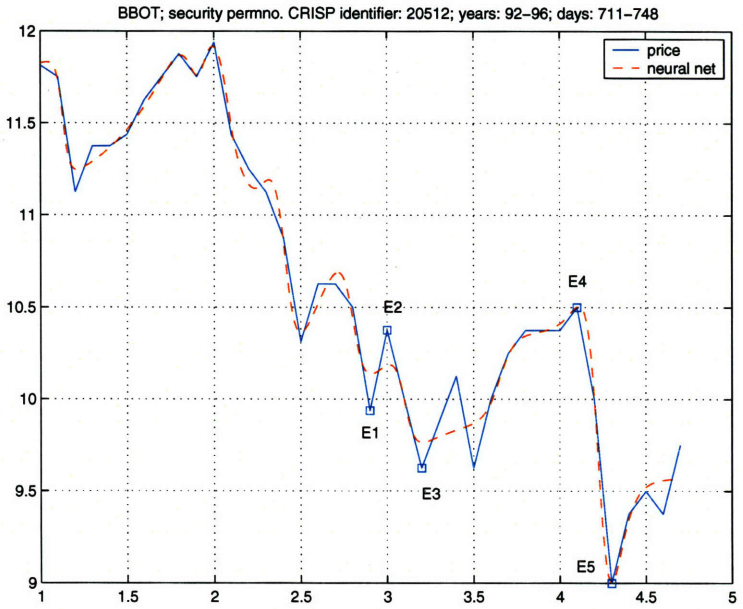

Figure 3-18: Higher Degree of Smoothing Case: Broadening Bottom Example

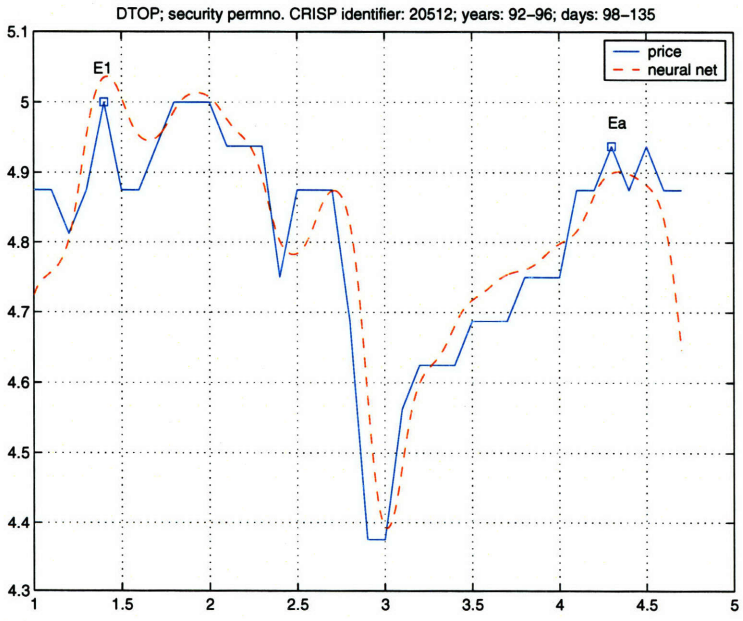

Figure 3-19: Higher Degree of Smoothing Case: Double Top Example

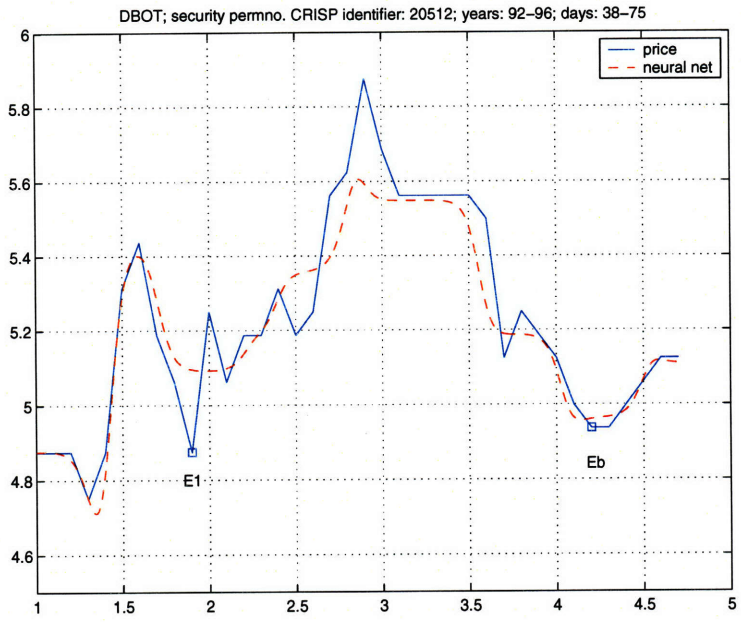

Figure 3-20: Higher Degree of Smoothing Case: Double Bottom Example

Inverse Head-and-Shoulders is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a minimum
- $E_3 < E_1$, $E_3 < E_5$
- E_1 and E_5 are within 1.5 percent of their average
- E_2 and E_4 are within 1.5 percent of their average

Triangle Top is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a maximum
- $E_1 > E_3 > E_5$
- $E_2 < E_4$

Triangle Bottom is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a minimum
- $E_1 < E_3 < E_5$
- $E_2 > E_4$

Rectangle Top is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a maximum
- tops are within 0.75 percent of their average
- bottoms are within 0.75 percent of their average
- lowest top > highest bottom

Rectangle Bottom is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a minimum
- tops are within 0.75 percent of their average
- bottoms are within 0.75 percent of their average
- lowest top > highest bottom

Broadening Top is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a maximum
- $E_1 < E_3 < E_5$
- $E_2 > E_4$

Broadening Bottom is defined by a sequence of five consecutive local extrema $E_1, ..., E_5$, such that

- E_1 is a minimum
- $E_1 > E_3 > E_5$
- $E_2 < E_4$

Double Top is defined by an initial local extremum E_1 and a subsequent local extremum E_a such that $E_a \equiv \sup\{P^*_{t_k} : t^*_k > t^*_1,\ k = 2, ..., n\}$, and where

- E_1 is a maximum
- E_1 and E_a are within 1.5 percent of their average
- $t^*_a - t^*_1 > 22$

Double Bottom is defined by an initial local extremum E_1 and a subsequent local extremum E_b such that $E_b \equiv \inf\{P^*_{t_k} : t^*_k > t^*_1,\ k = 2, ..., n\}$, and where

- E_1 is a minumum
- E_1 and E_b are within 1.5 percent of their average
- $t^*_b - t^*_1 > 22$

Note that the corresponding top and bottom (or inverse) patterns are mirror images of each other: the former occur at market tops and have bearish implications, while the latter occur at market bottoms and have bullish implications. Moreover, observe that the first in the sequence of the defining five extrema is a maximum for bearish formations and a minimum for bullish formations.

Pattern completion and the breaking of a neckline In a simpler version of pattern definitions, patterns are considered complete as soon as the final extremum has been detected. While Lo, Mamaysky, and Wang consider only this simpler version, we examine both this simpler version and a more complicated one, in which the breaking of the neckline condition is included in the definition of the first eight patterns under consideration (HS, TTOP, TBOT, RTOP, RBOT, BTOP, and BBOT).[9] For the bearish formations, the neckline is defined by a straight line drawn through the minima E_2 and E_4, while for the bullish formations it is defined by a straight line drawn through the maxima E_2 and E_4. If the breaking of the neckline condition is included in the definition of a bearish formation, then the formation is

[9]Including the breaking of the neckline condition in the definitions of DTOP and DBOT formations does not appear sensible given the fact that we will be focusing of short-horizon patterns (see, e.g., [82]).

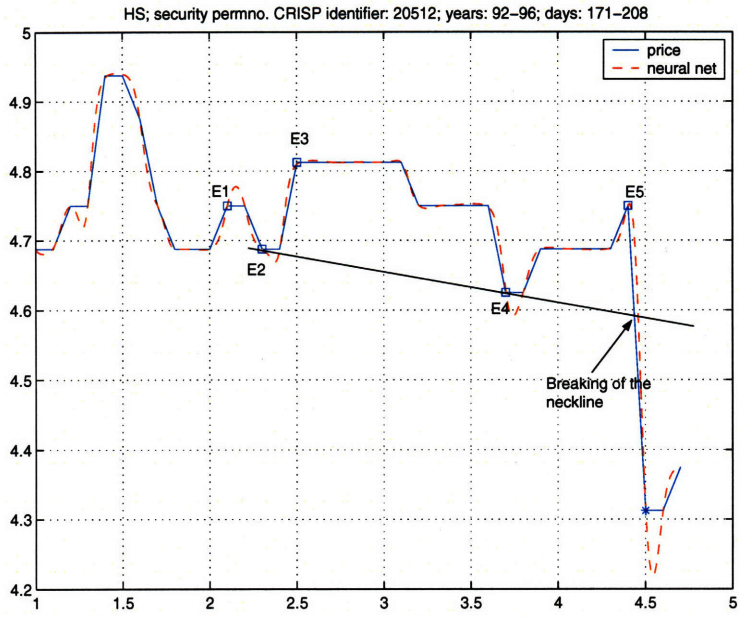

Figure 3-21: Breaking of the Neckline Case: Head-and-Shoulders Example

considered complete only when the price, moving downwards from the maximum E_5, closes under the neckline. Analogously, if the breaking of the neckline condition is included in the definition of a bullish formation, then the formation is considered complete only when the price, moving upwards from the minimum E_5, closes above the neckline. However, the exact amount of the closing violation of the neckline needed for a pattern to qualify as complete is widely disputed in the technical analysis literature. In our implementation, we classify a pattern as complete the instance the neckline is broken by any, however small, amount. Please see Figures 21-28 for illustration.

3.3.3 Scanning the neural network models for the presence of technical patterns

This final portion of our identification algorithm closely mimics that proposed by Lo, Mamaysky, and Wang.[10] In particular, given a sample of prices, $\{P_1, ..., P_T\}$, we construct rolling windows of data of length $l + d$, from t to $t + l + d - 1$, where t varies from 1 to $T - l - d + 1$, and where l and d are fixed parameters. As Lo, Mamaysky, and Wang explain, parameters l and d account for the fact that in practice a pattern is not detected as soon as it is completed, but that d days must pass between the completion and the detection of a pattern. Following Lo, Mamaysky, and Wang, we focus on short-horizon patterns, and, just like they do, we set $l = 35$ and $d = 3$, so that each window spans $l + d = 38$ trading days. As the said authors point out, splitting the data into rolling subsamples rather than fitting a

[10] Please see [73, pp. 1718-1720].

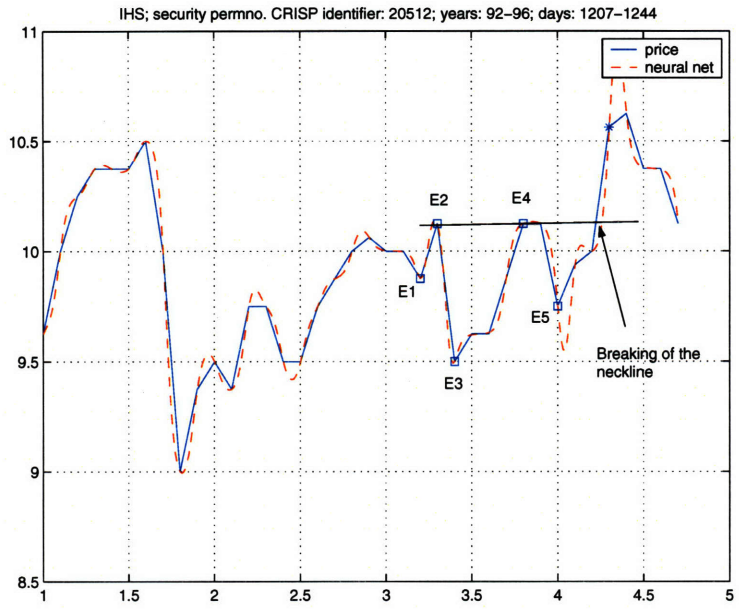

Figure 3-22: Breaking of the Neckline Case: Inverse Head-and-Shoulders Example

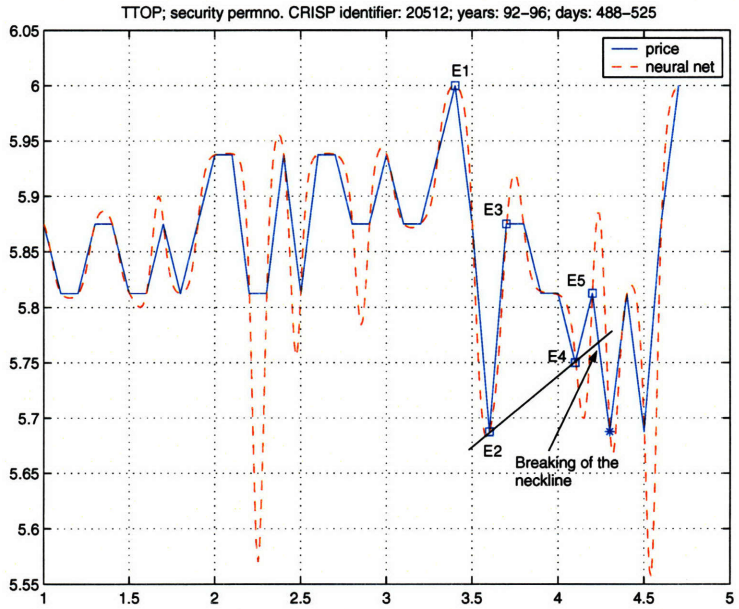

Figure 3-23: Breaking of the Neckline Case: Triangle Top Example

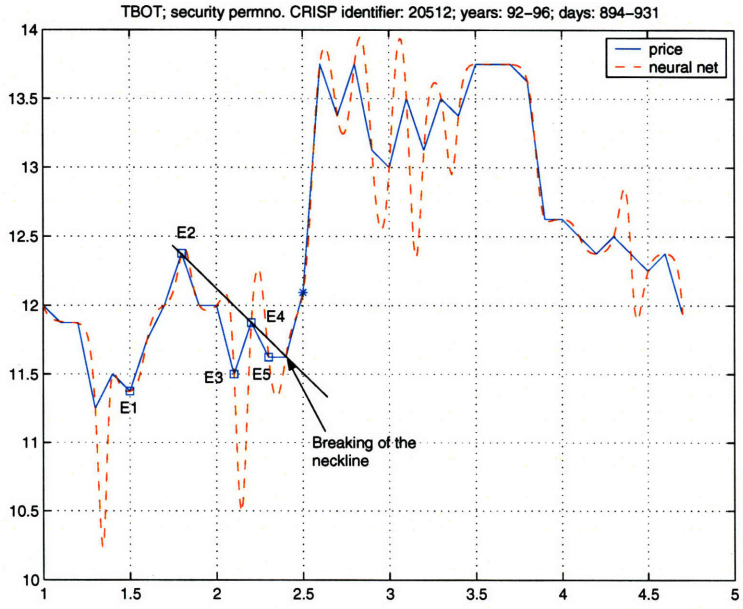

Figure 3-24: Breaking of the Neckline Case: Triangle Bottom Example

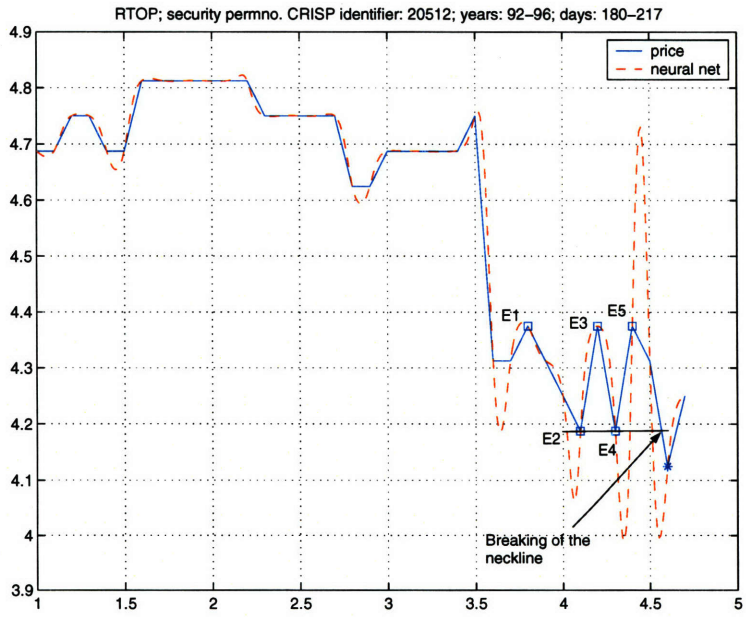

Figure 3-25: Breaking of the Neckline Case: Rectangle Top Example

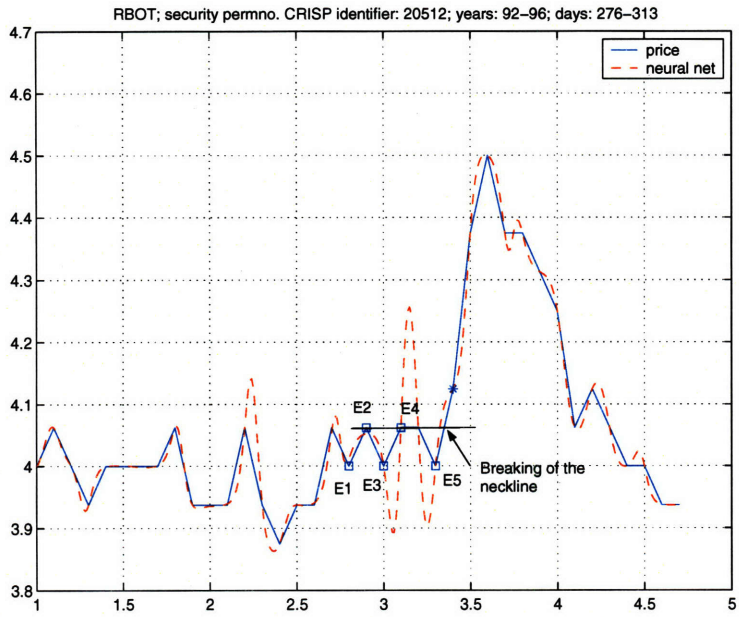

Figure 3-26: Breaking of the Neckline Case: Rectangle Bottom Example

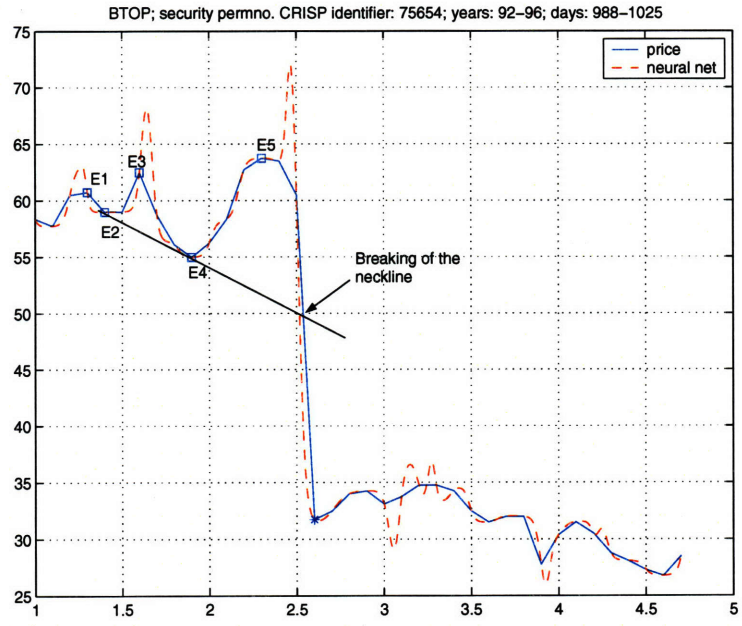

Figure 3-27: Breaking of the Neckline Case: Broadening Top Example

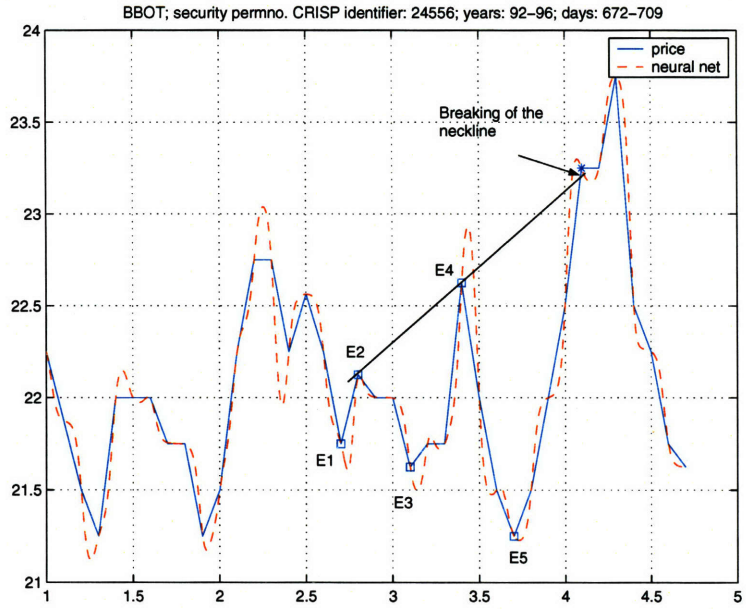

Figure 3-28: Breaking of the Neckline Case: Broadening Bottom Example

single smoothing estimator to the entire dataset is sensible, since in the latter case it would not be possible to distinguish signal from the noise.

Armed with a neural network model, $\hat{m}$, we then proceed to compute its local extrema by finding times τ such that $\text{Sgn}(\hat{m}'(\tau)) = -\text{Sgn}(\hat{m}'(\tau+1))$, where $\hat{m}'$ denotes the derivative of $\hat{m}$ with respect to τ, and $\text{Sgn}(\cdot)$ stands for the signum function. If $\text{Sgn}(\hat{m}'(\tau)) = +1$ and $\text{Sgn}(\hat{m}'(\tau+1)) = -1$, we have a local maximum, while if $\text{Sgn}(\hat{m}'(\tau)) = -1$ and $\text{Sgn}(\hat{m}'(\tau+1)) = +1$, we have a local minimum. If prices stay the same for several consecutive days so that $\hat{m}'(\tau) = 0$ for a particular τ, we look for an extremum by comparing $\text{Sgn}(\hat{m}'(\tau-1))$ and $Sgn(\hat{m}'(s))$, where $s = \inf\{s > \tau : \hat{m}'(s) \neq 0\}$. After we have identified all of the local extrema of a neural network in a given window, we proceed to identify the corresponding extrema in the original price series $\{P_t\}$, then scan the latter for the presence of one of the technical patterns previously defined.[11] For the first eight patterns under consideration, we also compute and store the date of the breaking of the neckline, the definition of which has been specified earlier. Finally, we repeat this procedure for each of the rolling subsample windows, until the end of the dataset is reached.

3.4 Evaluating the Significance of the Information Content of Technical Patterns

3.4.1 Comparing conditional and unconditional empirical distributions

To evaluate the informativeness of technical patterns, we again use the approach proposed by Lo, Mamaysky, and Wang in [73]. Namely, we compare the unconditional empirical distribution of returns with the corresponding conditional, or post-pattern, empirical distribution – if technical patterns are informative, then conditional and unconditional distributions should not be close. The distance between the distributions is measured in two ways, one, by the χ^2 test of goodness-of-fit, and two, by the Kolmogorov-Smirnov test.

The χ^2 test of goodness-of-fit Here we consider the null hypothesis that the returns are independently and identically distributed, and that the conditional and unconditional distributions are identical. For each pattern we compute the proportion of conditional returns falling into the decile j of unconditional returns:

$$\hat{\delta}_j \equiv \frac{\text{number of conditional returns in decile j}}{\text{total number of conditional returns}}, \; j = 1, ..., 10. \tag{3.5}$$

Under the null hypothesis of equality, the expected proportion is 0.1. Moreover, the asymptotic distribution of $\hat{\delta}_j$ is given by

$$\sqrt{n}(\hat{\delta}_j - 0.10) \sim^a \mathcal{N}(0, 0.10(1-0.10)). \tag{3.6}$$

[11] The neural network extrema that are not matched by the extrema in $\{P_t\}$ are discarded.

The asymptotic distribution of the corresponding goodness-of-fit statistic Q, as derived by Karl Pearson in 1900, is given by

$$Q \equiv \sum_{j=1}^{10} \frac{(n_j - 0.10n)^2}{0.10n} \sim^a \chi_9^2, \tag{3.7}$$

where n_j is the number of observations in decile j, and n is the total number of observations.[12]

The Kolmogorov-Smirnov test for two samples Consider two random samples, $X_1, ..., X_m$ and $Y_1, ..., Y_n$, each of which is *i.i.d.*, with cumulative distribution functions $F(x)$ and $G(x)$. We wish to test the null hypothesis that $F(x) = G(x)$, for $-\infty < x < \infty$, against the alternative that the null hypothesis is not true. Letting $F_m(x)$ and $G_n(x)$ denote the sample distribution functions calculated from the observed samples $X_1, ..., X_m$ and $Y_1, ..., Y_n$, we can construct statistics

$$D_{m,n} = sup_{-\infty<x<\infty}|F_m(x) - G_n(x)|, \text{ and} \tag{3.8}$$

$$\gamma_{m,n} = \sqrt{\frac{mn}{m+n}})D_{m,n}. \tag{3.9}$$

Now, recall the result established by N.V. Smirnov (1939):

$$\lim_{n\to\infty,\ n\to\infty}\text{Prob}(\gamma_{m,n} \leq x) = \sum_{k=-\infty}^{\infty} (-1)^k e^{-2k^2x^2},\ x > 0. \tag{3.10}$$

Kolmogorov-Smirnov test rejects the null hypothesis if the value statistic $\gamma_{m,n}$ is greater than the upper $100\alpha th$ percentile for the null distribution given by the above equation.

3.4.2 The data and the computation of the returns

The data The data comes from the Center for Research in Securities Prices (CRISP). It consists of daily price observations of a random sample of 25 Nasdaq stocks, from 1992 to 1996, with five stocks coming from each of the five market capitalization quintiles.

Computing the returns We start by subjecting each stock to our pattern recognition algorithm. For each pattern detected, we compute the one-day continuously compounded post-pattern returns d days after the pattern has been completed, where we recall that the parameter d is used to ensure that the post-pattern returns are computed entirely out-of-sample, that is, that no forward information is used in their computation.

[12] See, e.g., [31] or [73].

Then, for each stock we also consider nonoverlapping intervals of length one, and compute the unconditional one-day continuously compounded returns. Finally, we compare the empirical distribution functions of conditional and unconditional returns using the previously described goodness-of-fit measures. Here it is important to note that by using the χ^2 goodness-of-fit and Kolmogorov-Smirnov tests on the returns data, we are implicitly assuming that the returns are *i.i.d.*, which is not plausible, as Lo, Mamaysky, and Wang point out. However, as the said authors continue, the situation can be partially remedied by normalizing both conditional and unconditional returns of each security [73, p. 1719]. Following this suggestion, we standardize both conditional and unconditional returns of each individual stock, by subtracting its mean and dividing by its standard deviation.

3.4.3 Conditioning on volume

Technical analysts consider volume to be an important confirming indicator.[13] In general, volume is said to measure "the intensity or urgency behind the price move" [82, p. 162]. There are also many specific rules as to how the volume should behave as a pattern evolves, if it is to constitute a confirmation of that pattern. For example, in a downtrend, the volume should be heavier on the down moves and lighter on the bounces of a pattern, while the opposite should be true in an uptrend. Another example relates to the breaking of a neckline, which, as Murphy puts it, "should be accompanied by heavier trading activity if the signal given by that breakout is real" [82, p. 164]. Given the fact that volume plays such an important role in technical studies, we incorporate it into our investigation. However, following Lo, Mamaysky, and Wang, rather than considering all the nuances in the pattern-volume interaction, we simplify matters greatly in our analysis. Namely, for each stock, we compute its average share turnover during the first and second halves of each window, denoting the former by τ_1, and the latter by τ_2. An event such that $\tau_1 > 1.2\tau_2$ is labeled as "decreasing volume," while an even such that $\tau_2 > 1.2\tau_1$ is labeled as "increasing volume." We then construct conditional returns that are conditioned both on the occurrence of a pattern and the occurrence of a decreasing or increasing volume event.

3.5 Empirical Results and their Interpretation

3.5.1 Summary of cases to be investigated empirically

To sum up, we have three main cases to consider: (1) the case where the pattern recognition algorithm employs a lower degree of smoothing, (2) the case where it employs a higher degree of smoothing, and (3) the case where the low degree of smoothing is coupled with the breaking of the neckline requirement. For each of these three cases, the tests of the equality of the conditional and unconditional one-day normalized return distributions are performed with three different definitions of the conditional returns: (1) a distribution that is conditioned on the occurrence of one of the ten technical patterns under consideration,

[13] See, e.g., [82].

(2) a distribution that is conditioned on the occurrence of both one of the ten technical patterns and an increasing volume trend event, and (3) a distribution that is conditioned on the occurrence of both one of the ten technical patterns and a decreasing volume trend event.

3.5.2 Summary statistics

Tables 1 to 3 report frequency counts of the patterns detected for all the stocks together and in separate market capitalization quintiles, from 1992 to 1996. Table 1 refers to the case where the pattern recognition algorithm employs a lower degree of smoothing, Table 2 refers to the case where the pattern recognition algorithm employs a higher degree of smoothing, while Table 3 concerns the case where the lower degree of smoothing is coupled with the breaking of the neckline condition for the first eight patterns under consideration. We start by observing that the most frequent are RBOT patterns in all three cases. In the subsequent discussion, we will use these three tables to examine the effects that the change in the degree of smoothing, as well as the inclusion of the breaking of the neckline condition in the pattern definions, have on the frequency counts of these patterns, where the former effect is analyzed on comparison of Tables 1 and 2, and the latter on comparison of Tables 1 and 3.

Table 3.1: Frequency counts for 10 technical indicators detected among the Nasdaq stocks for 1992 to 1996, in market capitalization quintiles, where neural networks with a **lower degree of smoothing** were employed in the pattern recognition algorithm. As the "Sample" column indicates, the frequency counts are reported in three ways: (1) unconditional of volume, (2) conditioned on decreasing volume trend ('$\tau(\searrow)$'), and (3) conditioned on increasing volume trend ('$\tau(\nearrow)$').

Sample	Raw	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
All Stocks, 1992 to 1996											
Entire	23944	5680	3492	3067	2898	7213	9217	1560	1962	939	959
$\tau(\searrow)$	–	2390	1232	1350	1170	3028	3921	621	778	331	477
$\tau(\nearrow)$	–	2050	1322	958	940	2737	3445	567	727	307	175
Largest Quintile, 1992 to 1996											
Entire	4291	1008	464	175	120	2700	3016	97	230	125	89
$\tau(\searrow)$	–	456	177	81	53	1132	1233	15	94	35	48
$\tau(\nearrow)$	–	359	174	77	55	1104	1245	70	85	48	30
2nd Quintile, 1992 to 1996											
Entire	4600	918	452	420	410	1675	2357	257	422	159	166
$\tau(\searrow)$	–	343	193	189	177	730	1022	99	156	62	96
$\tau(\nearrow)$	–	431	172	138	148	641	945	95	199	74	35
3rd Quintile, 1992 to 1996											
Entire	4816	944	411	605	475	835	1494	298	399	227	126
$\tau(\searrow)$	–	378	147	270	213	324	636	119	162	69	82
$\tau(\nearrow)$	–	335	157	163	179	330	539	134	152	62	23
4th Quintile, 1992 to 1996											
Entire	4819	1443	958	578	759	1441	1749	472	364	203	246
$\tau(\searrow)$	–	653	356	229	336	647	836	222	168	98	106
$\tau(\nearrow)$	–	526	371	185	203	484	605	141	124	70	49
Smallest Quintile, 1992 to 1996											
Entire	5418	1367	1207	1289	1134	562	601	436	547	225	332
$\tau(\searrow)$	–	560	359	581	391	195	194	166	198	67	145
$\tau(\nearrow)$	–	399	448	395	355	178	111	127	167	53	38

Table 3.2: Frequency counts for 10 technical indicators detected among the Nasdaq stocks for 1992 to 1996, in market capitalization quintiles, where neural networks with a **higher degree of smoothing** were employed in the pattern recognition algorithm. As the "Sample" column indicates, the frequency counts are reported in three ways: (1) unconditional of volume, (2) conditioned on decreasing volume trend ('$\tau(\searrow)$'), and (3) conditioned on increasing volume trend ('$\tau(\nearrow)$').

Sample	Raw	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
All Stocks, 1992 to 1996											
Entire	23944	752	508	920	847	872	1314	517	567	590	531
$\tau(\searrow)$	–	321	205	426	357	409	526	180	258	236	257
$\tau(\nearrow)$	–	302	164	243	251	311	558	212	191	191	138
Largest Quintile, 1992 to 1996											
Entire	4291	75	51	68	64	296	383	11	41	88	53
$\tau(\searrow)$	–	26	18	29	38	127	149	3	18	41	23
$\tau(\nearrow)$	–	33	24	25	12	125	173	6	20	26	21
2nd Quintile, 1992 to 1996											
Entire	4600	216	114	142	133	238	442	136	112	108	122
$\tau(\searrow)$	–	77	53	87	70	102	157	47	71	44	62
$\tau(\nearrow)$	–	114	28	28	44	81	202	62	25	48	30
3rd Quintile, 1992 to 1996											
Entire	4816	196	128	255	182	174	286	128	155	132	84
$\tau(\searrow)$	–	90	51	125	75	79	117	38	61	56	47
$\tau(\nearrow)$	–	56	46	62	70	59	113	59	57	37	23
4th Quintile, 1992 to 1996											
Entire	4819	189	163	245	308	145	187	146	159	148	161
$\tau(\searrow)$	–	89	65	94	108	91	97	62	71	62	69
$\tau(\nearrow)$	–	79	51	74	92	40	66	49	59	45	42
Smallest Quintile, 1992 to 1996											
Entire	5418	76	52	210	160	19	16	96	100	114	111
$\tau(\searrow)$	–	39	18	91	66	10	6	30	37	33	56
$\tau(\nearrow)$	–	20	15	54	33	6	4	36	30	35	22

Table 3.3: Frequency counts for 10 technical indicators detected among the Nasdaq stocks for 1992 to 1996, in market capitalization quintiles, where the definitions of HS, IHS, TTOP, TBOT, RTOP, RBOT, BTOP, and BBOT patterns include the **breaking of the neckline** condition, and where a lower degree of smoothing is used. As the "Sample" column indicates, the frequency counts are reported in three ways: (1) unconditional of volume, (2) conditioned on decreasing volume trend ('$\tau(\searrow)$'), and (3) conditioned on increasing volume trend ('$\tau(\nearrow)$').

Sample	Raw	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
All Stocks, 1992 to 1996											
Entire	23944	2859	1973	2614	2514	3142	4280	85	96	939	959
$\tau(\searrow)$	–	1193	647	1172	1028	1247	1690	47	23	331	477
$\tau(\nearrow)$	–	1026	783	794	824	1226	1644	9	41	307	175
Largest Quintile, 1992 to 1996											
Entire	4291	437	207	145	111	1167	1332	0	0	125	89
$\tau(\searrow)$	–	225	101	72	52	481	504	0	0	35	48
$\tau(\nearrow)$	–	137	56	60	47	459	576	0	0	48	30
2nd Quintile, 1992 to 1996											
Entire	4600	450	255	389	346	641	1011	1	26	159	166
$\tau(\searrow)$	–	156	120	183	147	261	415	0	6	62	96
$\tau(\nearrow)$	–	214	97	123	131	283	424	1	13	74	35
3rd Quintile, 1992 to 1996											
Entire	4816	486	292	526	397	470	715	0	47	227	126
$\tau(\searrow)$	–	191	98	228	176	172	239	0	15	69	82
$\tau(\nearrow)$	–	192	121	149	152	208	284	0	23	62	23
4th Quintile, 1992 to 1996											
Entire	4819	714	480	502	663	521	871	25	4	203	246
$\tau(\searrow)$	–	330	148	203	294	225	409	7	2	98	106
$\tau(\nearrow)$	–	271	199	151	173	170	297	7	0	70	49
Smallest Quintile, 1992 to 1996											
Entire	5418	772	739	1052	997	343	351	59	19	225	332
$\tau(\searrow)$	–	291	180	486	359	108	123	40	0	67	145
$\tau(\nearrow)$	–	212	310	311	321	106	63	1	5	53	38

Comparing Tables 1 and 3, we observe that the triangle formations are the least sensitive, while the broadening formations are the most sensitive to whether or not the breaking of the neckline condition is included in their definitions. Specifically, defining a pattern as complete only after a breaking of the neckline has occurred reduces the total frequency counts by about 15% for TTOP and TBOT patterns, by about 50% for HS and IHS patterns, by about 60% for RTOP and RBOT patterns, and by more than 95% for BTOP and BBOT patterns. Comparing Tables 1 and 2, we note that the pattern recognition based on more smoothing reduces total frequency counts by $85 - 90\%$ for HS, IHS, RTOP, and RBOT patterns, by about 70% for TTOP, TBOT, BTOP, and BBOT patterns, and by about 40% for DTOP and DBOT patterns.

These results make a lot of sense. First of all, the triangle and the broadening formations are similar in that they both react in an extreme way to the inclusion of the breaking of the neckline condition in their definitions, with the triangle formations being the least sensitive, and the broadening formations being the most sensitive of all the patterns considered. Such behavior may be understood by examining the geometrical shapes of these patterns. A triangle consists of the upper descending trendline and the lower ascending trendline which meet at the apex on the right. Since these trendlines are converging, it is easy for the price to break outside the formation and thereby break the neckline. On the contrast, in the broadening formation the trendlines actually diverge, making it hard for the price to break outside the formation, that is, to break the neckline. Moreover, these two types of formations undergo the same amount of percent reduction in their frequency counts when they are switched from a lower to a higher degree of smoothing, further emphasizing the possibility of the existence of some inherent analogies between them, which should be examined more closely in future research.

The magnitude of the reduction in the number of broadening formations detected between Tables 1 and 3 (more than 95%) suggests that the breaking of the neckline condition may well be an important element of their definitions, since having few of them agrees with their characterization as "unusual" and "relatively rare" by technical analysts [82, p. 140]. It is also insightful to note that for the broadening top, the two smallest market capitalization quintiles contain most of the patterns. This is especially evident in Table 2, where the three largest quintiles together contain only two patterns. These results seem to support Murphy's statement that a broadening top "represents a market that is out of control and unusually emotional," as these are likely to be the characteristics of small cap firms [82, pp. 140-141].

Another interesting observation is that for most of the pattern types under consideration, frequency counts reduce as we move from Table 1 to Table 3, and further reduce as we move from Table 3 to Table 2. The only exceptions are broadening tops and bottoms, where the frequency counts reduce as we move from Table 1 to Table 2, and further reduce as we move from Table 2 to Table 3. This, coupled with the dramatic extent of their total reduction, suggests yet again that there may exist something unusual about the nature of these patterns and the kind of market conditions that they characterize, lending further support to the above-mentioned statement that a broadening top "represents a market that is out of control and unusually emotional" [82, pp. 140-141].

The fact that the inclusion of the breaking of the neckline condition in the definitions of HS and IHS patterns yields a 50% reduction in their frequency counts also makes sense in terms of their geometry, since for these patterns the neckline neither always eases nor always deters the breakout, but is equally likely to either descend, ascend, or stay flat. Moreover, the amount of change induced by the inclusion of the breaking of the neckline condition in pattern definitions is comparable for head-and-shoulders and rectangle formations, which also change by a similar amount when the pattern recognition algorithm switches from a lower to a higher degree of smoothing. Noting, in addition, that RBOT, RTOP, and HS are the three most frequent pattern types in Tables 1 and 3, we suspect that, while technical analysis literature mostly categorizes rectangles together with triangles rather than with head-and-shoulders in terms of their duration and forecasting value, there may exist some inherent similarities between the rectangle and the head-and-shoulders formations, which become apparent only with a certain degree of smoothing, and which should be investigated further.

Furthermore, the near equality of the reduction rates for the corresponding top and bottom pattern types, both from Table 1 to Table 2 and from Table 1 to Table 3, is what one would expect, since they are just the mirror images of each other. Finally, we note that these reduction rates remain mostly the same regardless of whether the counts are unconditional of volume, or conditioned on a decreasing or increasing volume trend.[14] Although no definitive conclusion can be drawn from this simple observation, it does make us question the extent of the incremental information that conditioning on increasing or decreasing volume trend provides, an issue which will be investigated later in this thesis.

We also examine the detected patterns for the evidence of clustering, both by date and by size quintiles. For this purpose, for each of the three cases under consideration, we plot the cross-sectional and time-series distributions of each pattern, so that, on a given graph, the vertical axis stands for the size quintile, the horizontal axis stands for the date, and each circle represents a detected pattern (please see Figures 29-56). Upon the examination of these displays, we conclude that patterns are neither clustered in time nor in cross-section.

[14]The only exception is seen in the case of DBOT on increasing volume.

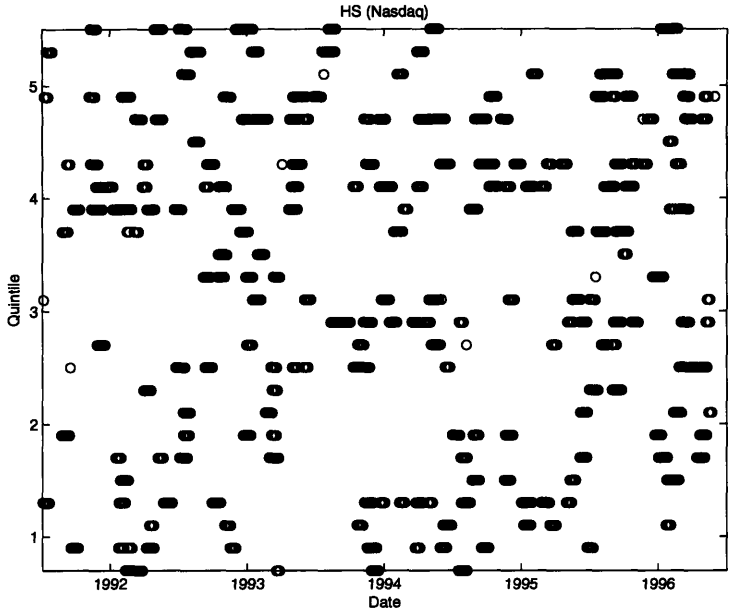

Figure 3-29: Lower Degree of Smoothing Case: Distribution of HS Patterns

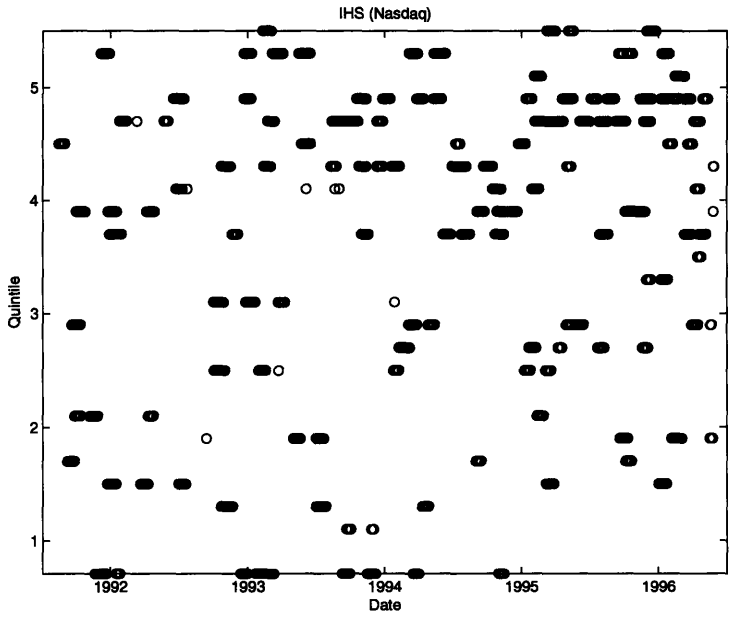

Figure 3-30: Lower Degree of Smoothing Case: Distribution of IHS Patterns

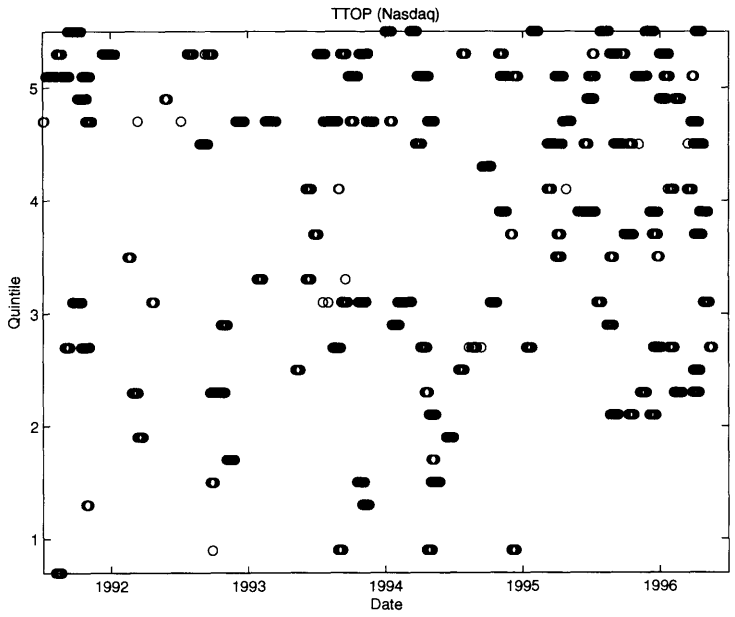

Figure 3-31: Lower Degree of Smoothing Case: Distribution of TTOP Patterns

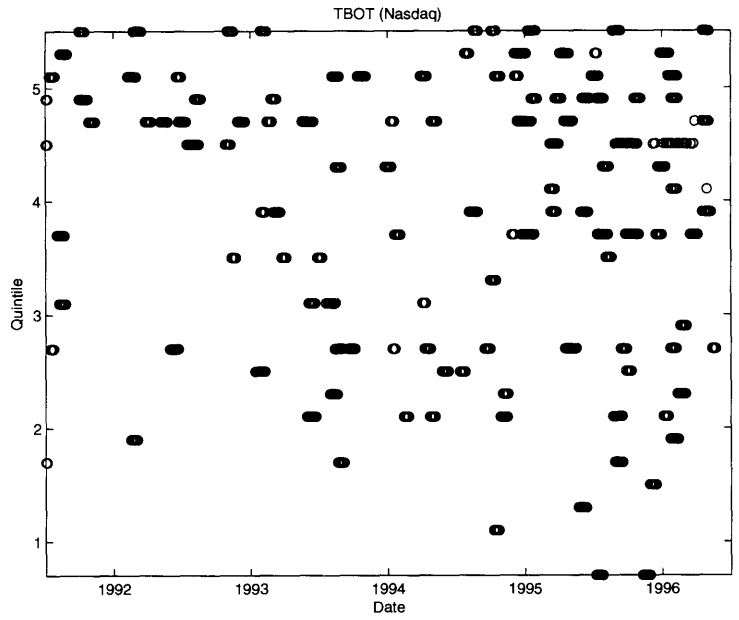

Figure 3-32: Lower Degree of Smoothing Case: Distribution of TBOT Patterns

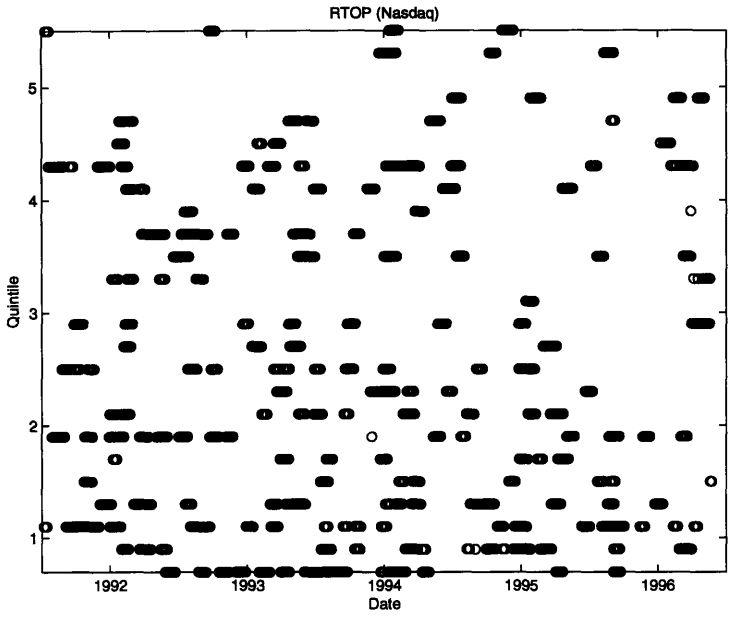

Figure 3-33: Lower Degree of Smoothing Case: Distribution of RTOP Patterns

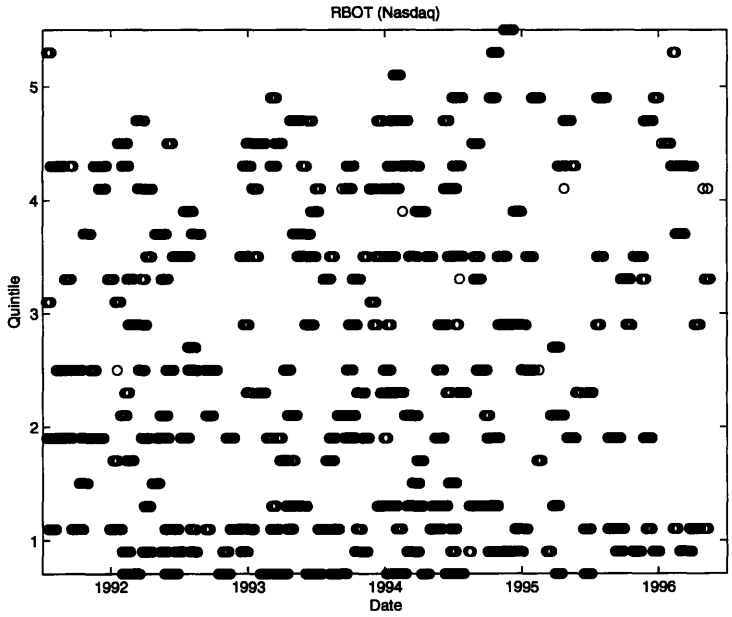

Figure 3-34: Lower Degree of Smoothing Case: Distribution of RBOT Patterns

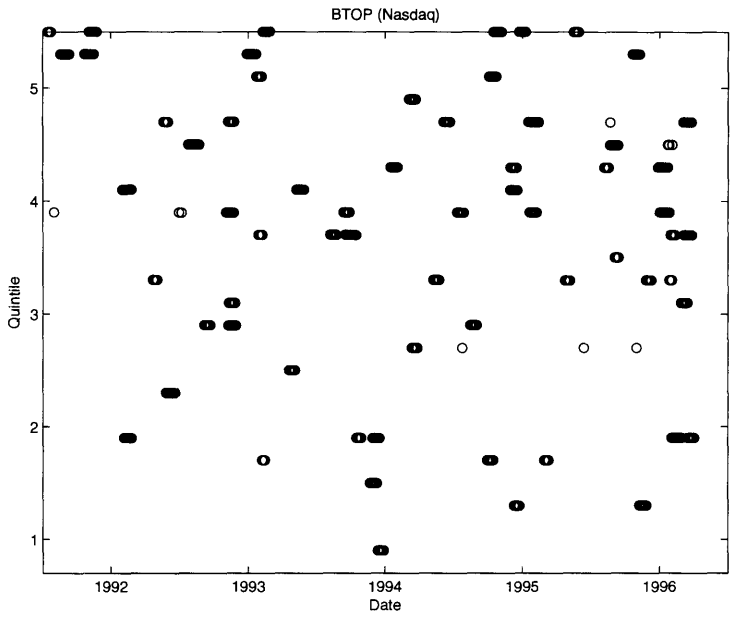

Figure 3-35: Lower Degree of Smoothing Case: Distribution of BTOP Patterns

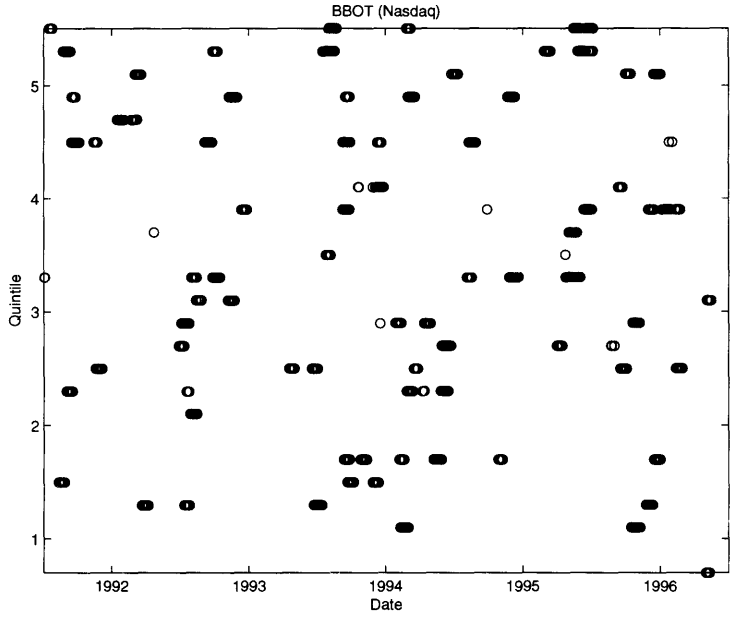

Figure 3-36: Lower Degree of Smoothing Case: Distribution of BBOT Patterns

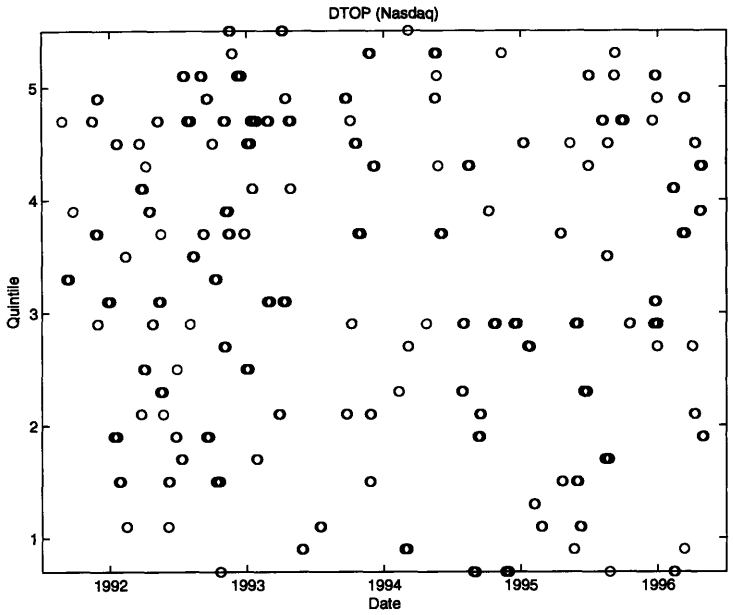

Figure 3-37: Lower Degree of Smoothing Case: Distribution of DTOP Patterns

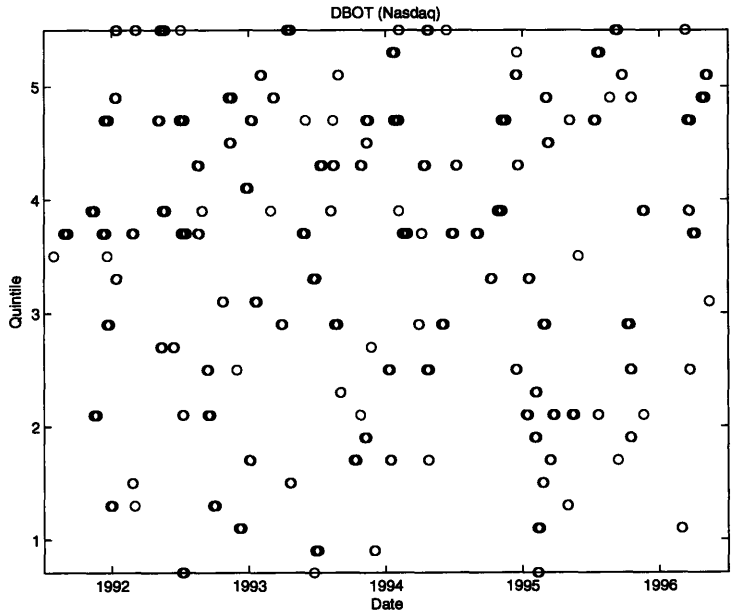

Figure 3-38: Lower Degree of Smoothing Case: Distribution of DBOT Patterns

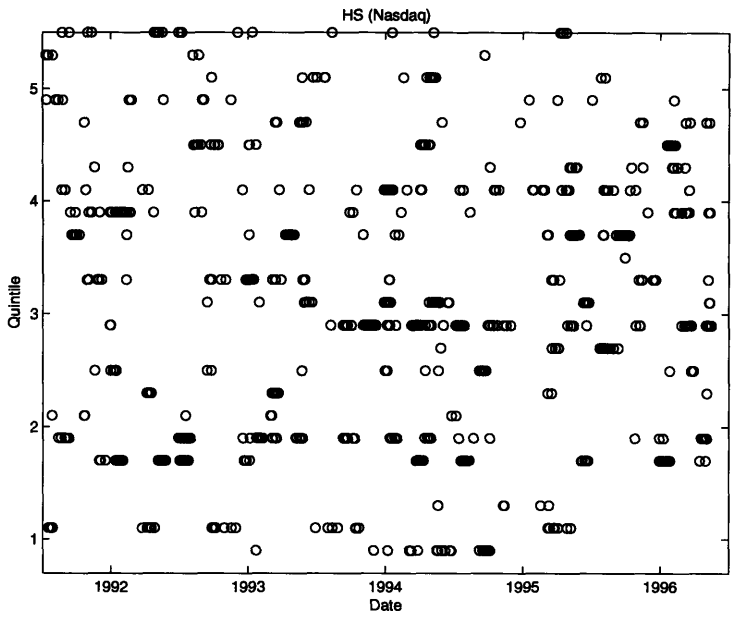

Figure 3-39: Higher Degree of Smoothing Case: Distribution of HS Patterns

We next report the summary statistics (means, standard deviations, skewness, and sample kurtosis) of the unconditional (raw) returns, and the returns conditional on the occurrence of one of the technical patterns under consideration for all the Nasdaq stocks form our sample and in size quintiles. These statistics are presented for each of the three cases under consideration: Tables 4 to 6 refer to the case where the pattern recognition algorithm employs a lower degree of smoothing, the case where it is based on a higher degree of smoothing, and the case where a lower degree of smoothing is coupled with the breaking of the neckline requirement, respectively.

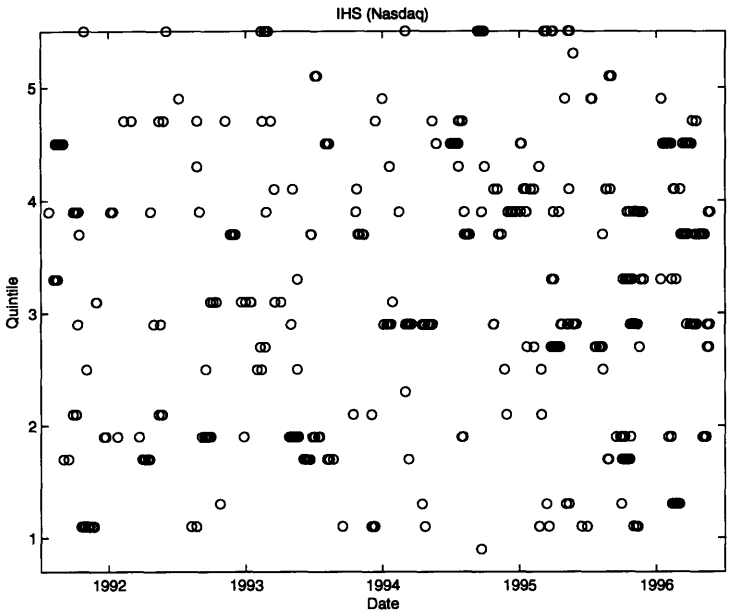

Figure 3-40: Higher Degree of Smoothing Case: Distribution of IHS Patterns

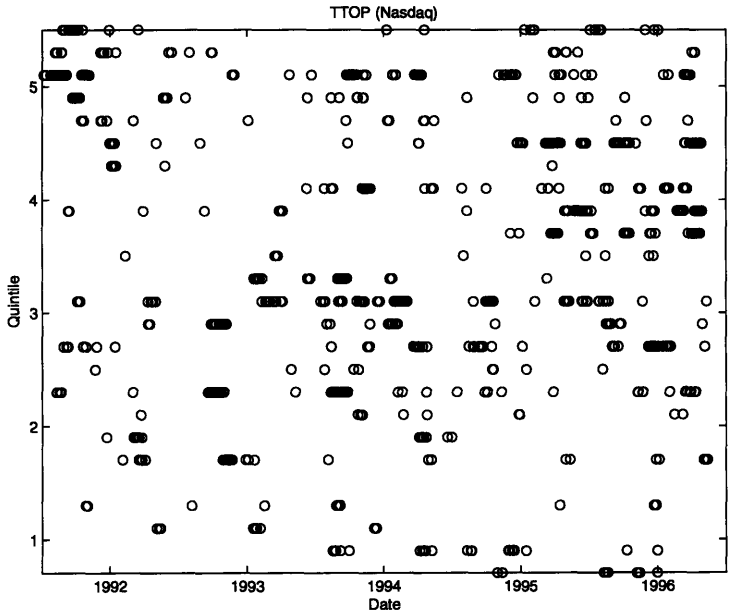

Figure 3-41: Higher Degree of Smoothing Case: Distribution of TTOP Patterns

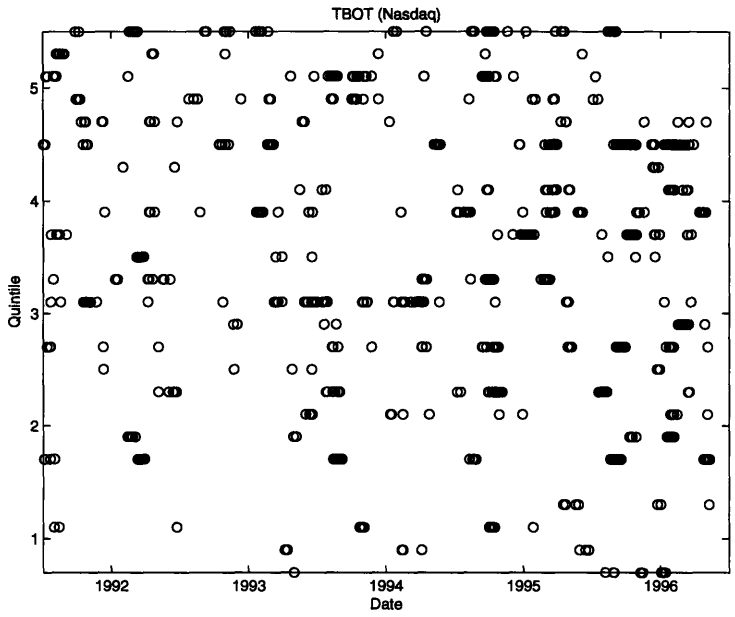

Figure 3-42: Higher Degree of Smoothing Case: Distribution of TBOT Patterns

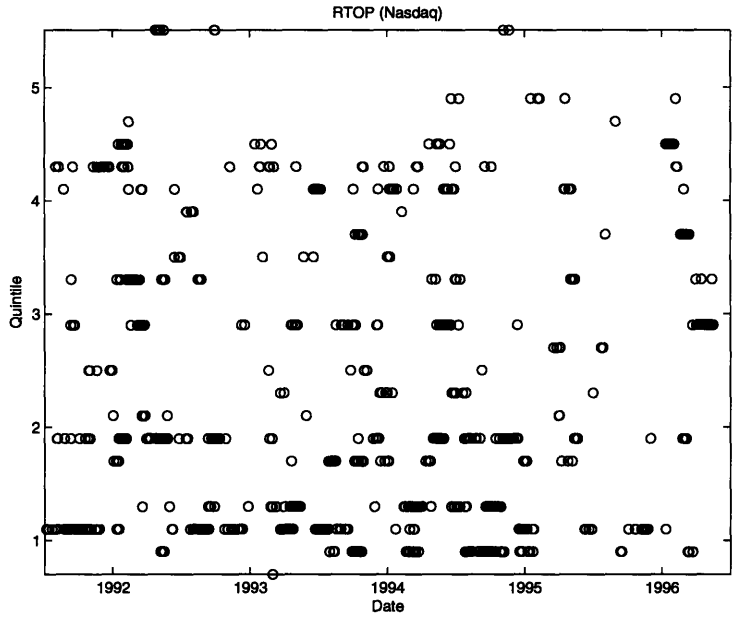

Figure 3-43: Higher Degree of Smoothing Case: Distribution of RTOP Patterns

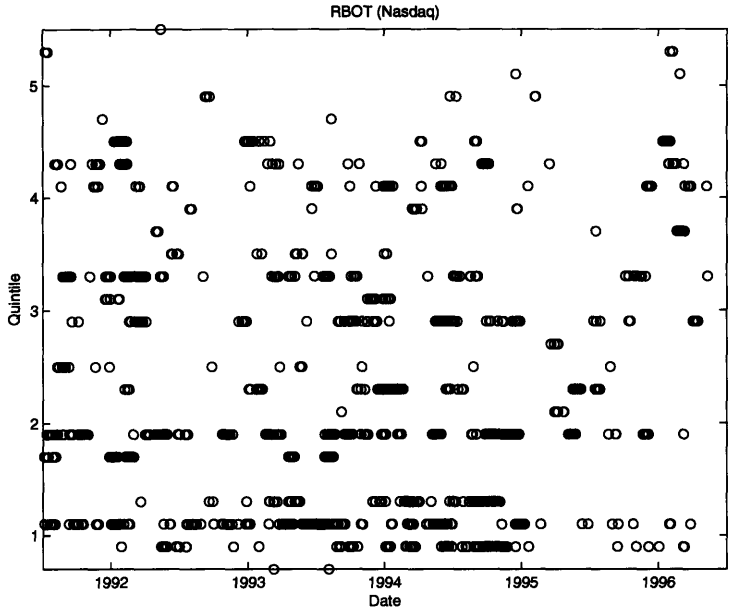

Figure 3-44: Higher Degree of Smoothing Case: Distribution of RBOT Patterns

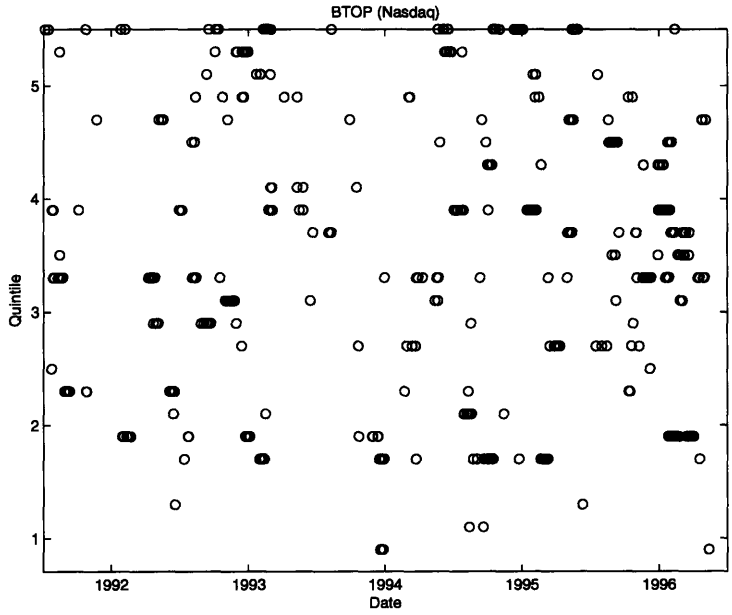

Figure 3-45: Higher Degree of Smoothing Case: Distribution of BTOP Patterns

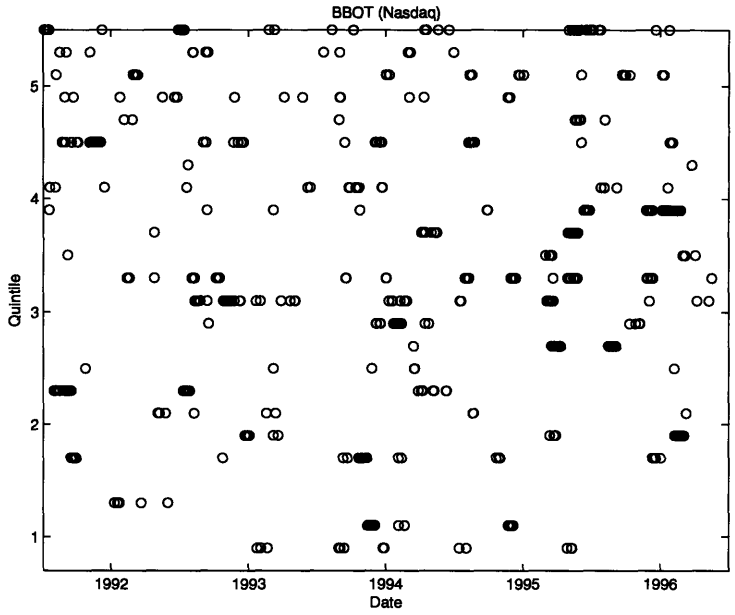

Figure 3-46: Higher Degree of Smoothing Case: Distribution of BBOT Patterns

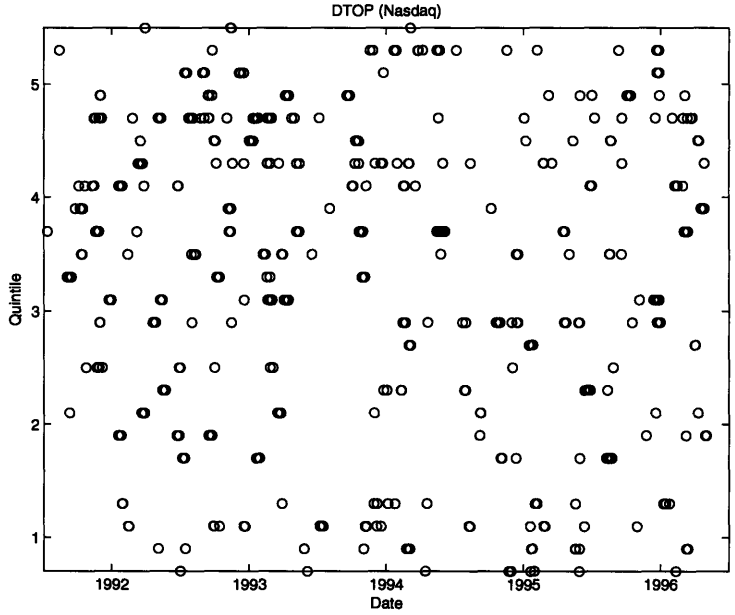

Figure 3-47: Higher Degree of Smoothing Case: Distribution of DTOP Patterns

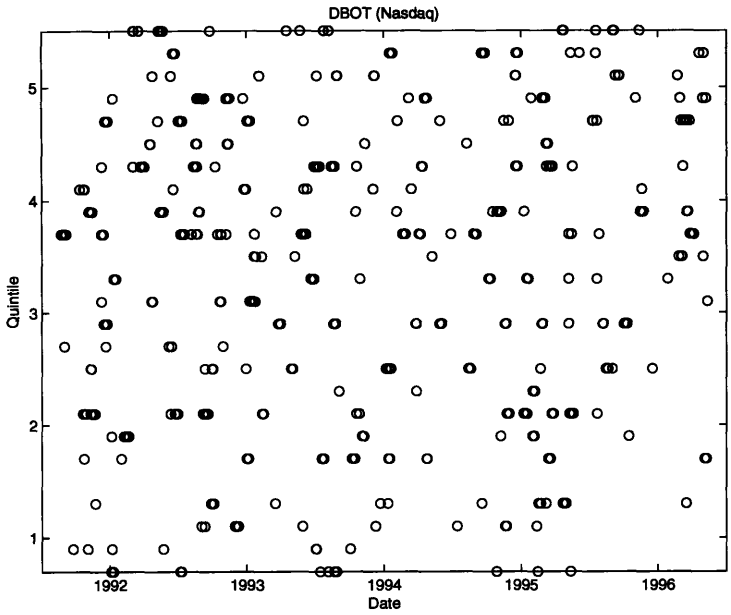

Figure 3-48: Higher Degree of Smoothing Case: Distribution of DBOT Patterns

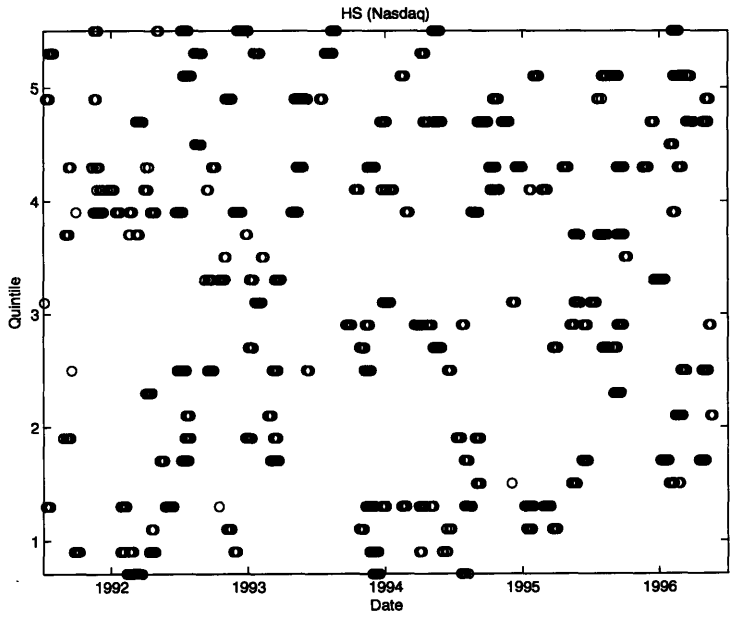

Figure 3-49: Breaking of the Neckline Case: Distribution of HS Patterns

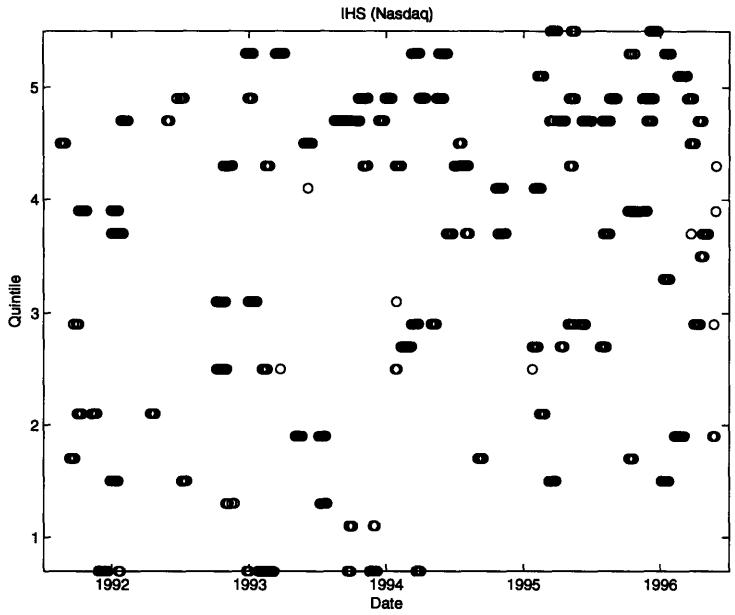

Figure 3-50: Breaking of the Neckline Case: Distribution of IHS Patterns

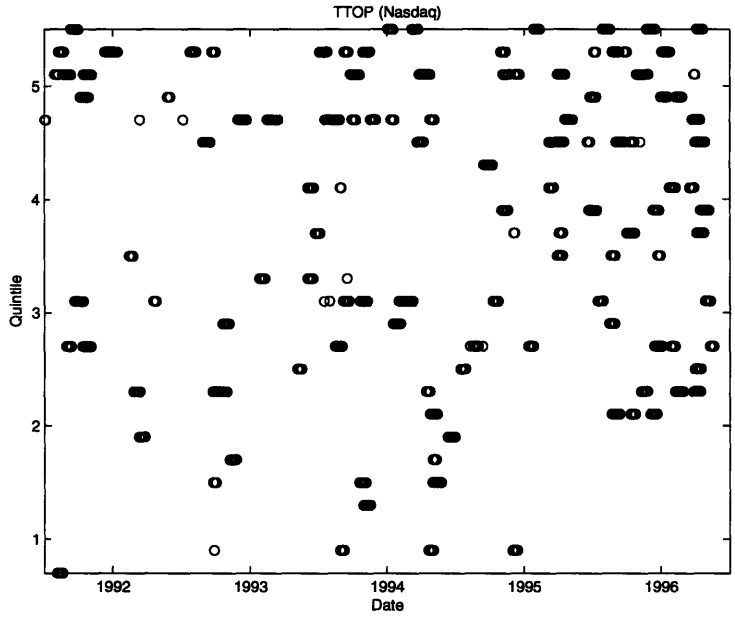

Figure 3-51: Breaking of the Neckline Case: Distribution of TTOP Patterns

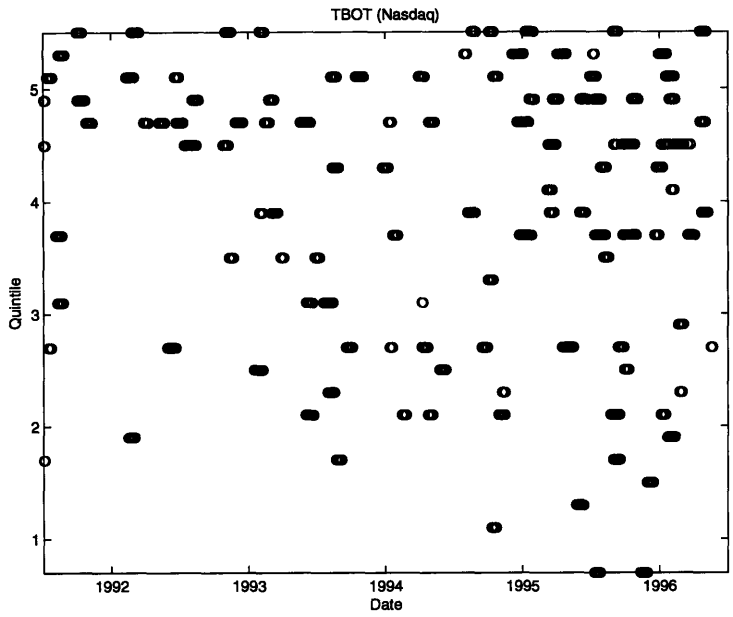

Figure 3-52: Breaking of the Neckline Case: Distribution of TBOT Patterns

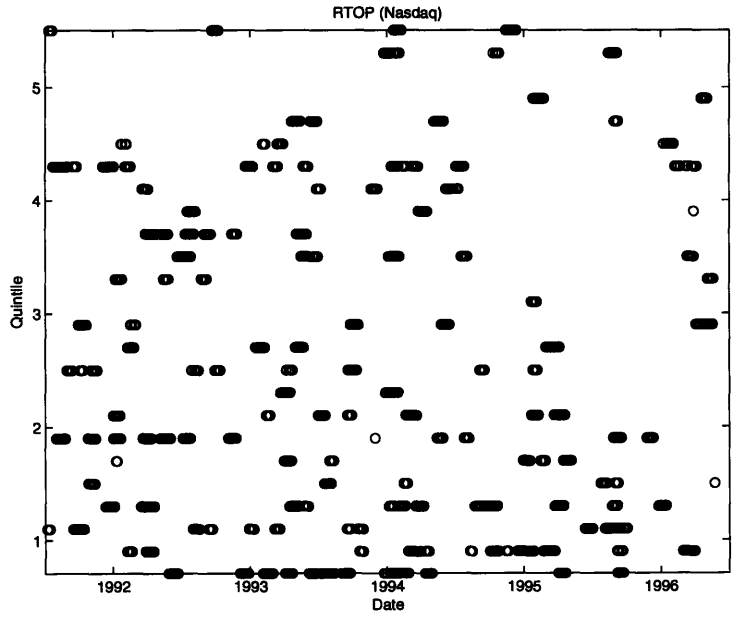

Figure 3-53: Breaking of the Neckline Case: Distribution of RTOP Patterns

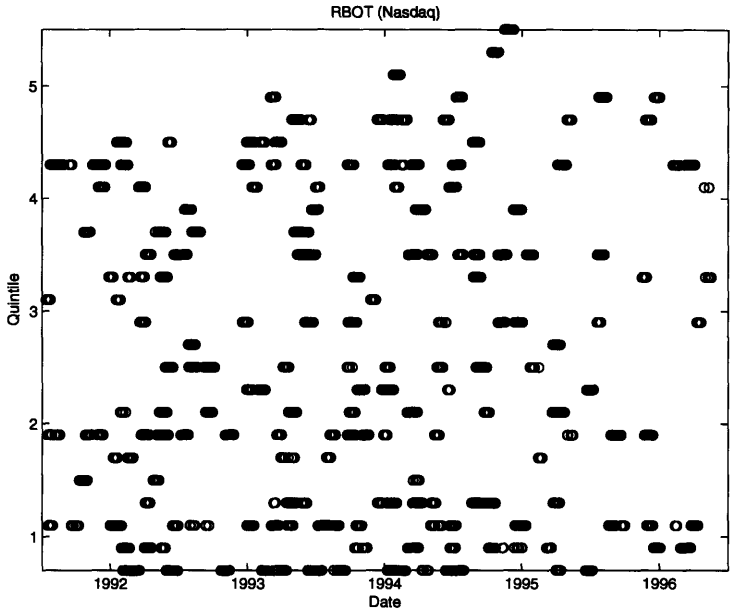

Figure 3-54: Breaking of the Neckline Case: Distribution of RBOT Patterns

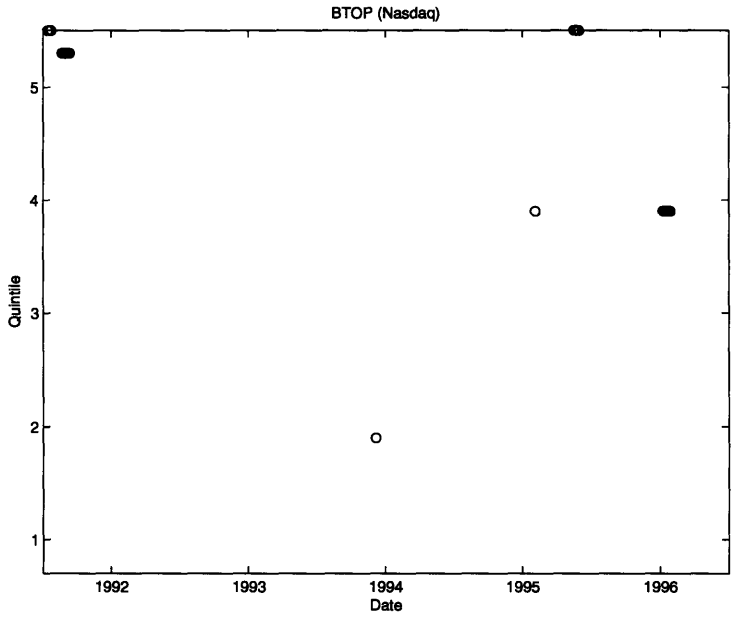

Figure 3-55: Breaking of the Neckline Case: Distribution of BTOP Patterns

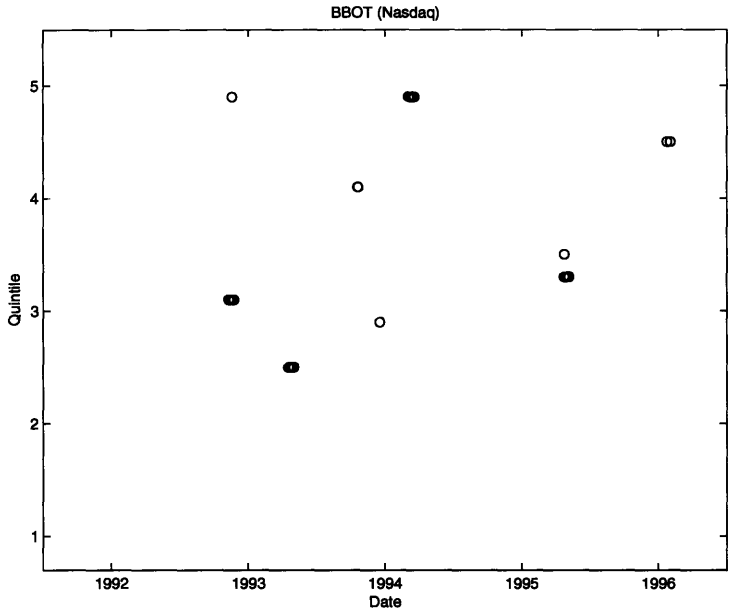

Figure 3-56: Breaking of the Neckline Case: Distribution of BBOT Patterns

Table 3.4: Summary statistics of raw and conditional one-day normalized returns, where **lower degree of smoothing** was used.

Moment	Raw	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
All Stocks, 1992 to 1996											
Mean	0.0000	−0.0000	−0.0044	−0.0049	−0.0014	−0.0035	0.0064	0.0269	−0.0076	0.0002	−0.0120
S.D.	0.9995	0.9979	0.9968	0.9916	0.9844	0.9984	0.9987	0.9786	0.9900	0.9844	0.9815
Skew.	0.0602	0.1216	0.4174	−0.1815	0.3393	0.0675	−0.0894	−0.0371	0.1135	−0.1635	−0.2553
Kurt.	16.1842	2.3216	3.5275	3.2331	2.9721	3.0825	3.2391	2.2708	3.0775	2.8654	2.7013
Largest Quintile, 1992 to 1996											
Mean	0.0000	−0.0000	−0.0000	0.0714	0.0235	−0.0000	0.0000	−0.0206	0.0630	0.0017	0.0000
S.D.	0.9995	0.9980	0.9968	0.9037	0.6426	0.9993	0.9993	0.7214	0.9914	0.9631	0.9770
Skew.	1.6233	0.3349	0.1880	0.3597	0.1379	−0.0071	−0.1302	0.0305	−0.5653	−0.3025	0.1189
Kurt.	24.1005	2.6193	2.6016	1.7330	2.4193	3.1353	3.2580	1.8670	1.7633	2.0233	1.8322
2nd Quintile, 1992 to 1996											
Mean	0.0000	0.0000	−0.0000	0.0000	−0.0000	−0.0000	0.0000	0.0039	−0.0699	−0.0000	0.0000
S.D.	0.9996	0.9978	0.9967	0.9952	0.9951	0.9988	0.9992	0.9941	0.9940	0.9873	0.9535
Skew.	0.8915	−0.1445	0.6005	−0.1373	0.2840	−0.0192	0.1068	−0.1490	0.8422	−0.0977	−0.0559
Kurt.	11.9483	1.7597	3.1006	1.6416	1.5410	3.8114	3.9849	1.5875	2.8223	3.3404	2.4796
3rd Quintile, 1992 to 1996											
Mean	0.0000	−0.0000	−0.0377	−0.0000	−0.0147	−0.0305	0.0000	0.0788	0.0000	−0.0000	0.0000
S.D.	0.9996	0.9979	0.9944	0.9967	0.9957	0.9971	0.9987	0.9901	0.9720	0.9911	0.9839
Skew.	−0.6686	−0.0660	0.2905	0.1639	0.6487	0.0975	−0.2945	−0.6429	0.1928	−0.3869	−0.2257
Kurt.	15.8906	1.9401	2.1066	4.0923	2.5879	1.9680	2.3146	2.9047	3.9969	2.8052	1.7873
4th Quintile, 1992 to 1996											
Mean	0.0000	−0.0000	−0.0000	−0.0476	−0.0000	−0.0000	−0.0000	0.0000	−0.0000	0.0000	−0.0467
S.D.	0.9996	0.9986	0.9979	0.9954	0.9974	0.9986	0.9989	0.9957	0.9959	0.9900	0.9907
Skew.	−0.2723	0.2103	0.5290	−0.4124	−0.0197	−0.0174	0.1601	0.5165	−0.2090	−0.2510	−0.5360
Kurt.	9.3622	2.7239	2.2319	2.0677	2.3970	2.5383	3.2492	2.8399	5.2540	3.5172	3.1566
Smallest Quintile, 1992 to 1996											
Mean	−0.0000	−0.0000	0.0000	−0.0000	0.0000	−0.0000	0.0982	0.0447	0.0000	−0.0000	0.0000
S.D.	0.9996	0.9985	0.9983	0.9984	0.9982	0.9973	0.9918	0.9944	0.9963	0.9910	0.9939
Skew.	−0.9395	0.1781	0.3910	−0.3031	0.4756	0.8630	−0.8874	−0.1844	−0.0017	0.1653	−0.2408
Kurt.	19.8401	2.3163	5.5330	3.9451	3.9408	3.7029	2.7775	1.6964	1.9866	2.4217	2.9588

Table 3.5: Summary statistics of raw and conditional one-day normalized returns, where **higher degree of smoothing** was used.

Moment	Raw	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
All Stocks, 1992 to 1996											
Mean	0.0000	-0.0001	-0.0002	-0.0000	0.0000	0.0000	-0.0004	-0.0005	-0.0000	-0.0000	-0.0000
S.D.	0.9995	0.9846	0.9781	0.9869	0.9857	0.9850	0.9881	0.9765	0.9795	0.9794	0.9703
Skew.	0.0602	0.4281	0.3214	-0.0405	-0.0479	0.2189	0.2300	0.3221	-0.3785	-0.0805	-0.0302
Kurt.	16.1842	2.7049	3.8352	3.6661	3.7415	2.8782	3.2339	3.0272	4.0120	3.0509	2.8017
Largest Quintile, 1992 to 1996											
Mean	0.0000	0.0000	-0.0021	-0.0000	0.0000	0.0000	-0.0013	-0.0251	0.0000	0.0000	0.0000
S.D.	0.9995	0.9795	0.9697	0.9697	0.9677	0.9932	0.9922	0.7766	0.9618	0.9767	0.9608
Skew.	1.6233	0.3184	0.7767	0.3609	-0.5892	0.2189	0.1127	1.3023	0.5498	0.2267	0.3538
Kurt.	24.1005	3.0938	6.0847	1.9356	4.8120	2.9361	2.9324	3.6174	2.2201	2.4291	2.3655
2nd Quintile, 1992 to 1996											
Mean	-0.0000	0.0000	0.0009	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	-0.0000	0.0000	-0.0000
S.D.	0.9996	0.9907	0.9822	0.9857	0.9847	0.9915	0.9955	0.9851	0.9818	0.9811	0.9535
Skew.	0.8915	0.1550	0.1718	-0.3315	0.3670	0.3961	0.5849	0.6248	-0.3629	0.1551	0.2347
Kurt.	11.9483	2.4011	3.8405	2.4073	3.0025	3.5110	3.3037	4.4198	3.1390	2.4790	2.1883
3rd Quintile, 1992 to 1996											
Mean	0.0000	-0.0004	-0.0000	-0.0000	0.0000	0.0000	-0.0004	-0.0000	-0.0000	-0.0000	-0.0000
S.D.	0.9996	0.9897	0.9881	0.9921	0.9889	0.9913	0.9841	0.9841	0.9869	0.9846	0.9756
Skew.	-0.6686	0.5791	0.8203	0.3771	0.4965	0.1321	-0.0420	-0.0009	-0.2792	-0.2971	-0.0736
Kurt.	15.8906	2.8983	3.2583	3.9748	3.2595	1.9657	2.6028	2.9717	2.8262	4.0483	2.3791
4th Quintile, 1992 to 1996											
Mean	0.0000	-0.0000	0.0000	-0.0000	0.0000	0.0000	-0.0000	-0.0000	0.0000	0.0000	-0.0000
S.D.	0.9996	0.9893	0.9876	0.9918	0.9935	0.9682	0.9892	0.9861	0.9873	0.9863	0.9874
Skew.	-0.2723	0.4249	0.0348	-0.0189	-0.3024	0.0620	0.0634	0.3668	-0.8362	-0.3105	-0.0655
Kurt.	9.3622	2.4950	3.6309	3.7051	3.1276	2.8707	4.6781	2.1853	5.3469	3.3050	2.6900
Smallest Quintile, 1992 to 1996											
Mean	-0.0000	-0.0000	-0.0015	0.0000	-0.0000	-0.0000	-0.0004	0.0000	-0.0000	-0.0000	-0.0000
S.D.	0.9996	0.9730	0.9600	0.9904	0.9873	0.9428	0.8564	0.9787	0.9796	0.9821	0.9816
Skew.	-0.9395	0.9614	-0.1472	-0.5031	-0.3099	-0.1827	-0.5437	0.1966	-0.1575	0.0211	-0.3824
Kurt.	19.8401	3.2741	3.8748	4.5748	5.7258	2.1261	1.7074	2.3107	5.3577	2.5498	4.0561

Table 3.6: Summary statistics of one-day raw and conditional returns, where **breaking of the neckline condition** and lower degree of smoothing were used.

Moment	Raw	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
All Stocks, 1992 to 1996											
Mean	0.0000	-0.0000	0.0000	-0.0057	-0.0103	-0.0000	-0.0062	0.2646	-0.0134	0.0002	-0.0120
S.D.	0.9995	0.9958	0.9844	0.9956	0.9871	0.9963	0.9908	0.9452	0.4360	0.9844	0.9815
Skew.	0.0602	0.0600	0.0842	0.3373	0.0387	-0.0577	-0.0893	1.1689	9.0572	-0.1635	-0.2553
Kurt.	16.1842	3.7593	2.8270	2.6352	2.4984	2.6518	2.8723	7.1029	86.7438	2.8654	2.7013
Largest Quintile, 1992 to 1996											
Mean	0.0000	-0.0000	-0.0000	0.0792	-0.1971	-0.0000	-0.0000	-	-	0.0017	0.0000
S.D.	0.9995	0.9954	0.9927	0.9863	0.7490	0.9983	0.9985	-	-	0.9631	0.9770
Skew.	1.6233	-0.7398	0.0153	-0.2607	0.4408	-0.2169	0.0287	-	-	-0.3025	0.1189
Kurt.	24.1005	3.1904	2.9050	1.9648	3.6688	2.6937	3.2632	-	-	2.0233	1.8322
2nd Quintile, 1992 to 1996											
Mean	-0.0000	0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	0	-0.0279	-0.0000	0.0000
S.D.	0.9996	0.9955	0.9941	0.9948	0.9942	0.9969	0.9980	0	0	0.9873	0.9535
Skew.	0.8915	1.0235	0.0678	0.4447	-0.4727	-0.2242	-0.1282	-	-	-0.0977	-0.0559
Kurt.	11.9483	6.2544	2.1646	3.0521	2.6752	3.0778	2.3851	-	-	3.3404	2.4796
3rd Quintile, 1992 to 1996											
Mean	0.0000	-0.0000	0.0000	0.0000	-0.0101	0.0000	-0.0000	-	-0.0093	-0.0000	0.0000
S.D.	0.9996	0.9959	0.9232	0.9962	0.9949	0.9957	0.9972	-	0.0313	0.9911	0.9839
Skew.	-0.6686	-0.2628	0.4958	0.1807	-0.1480	0.1967	-0.1539	-	4.1224	-0.3869	-0.2257
Kurt.	15.8906	2.5248	1.9866	2.4798	1.9869	1.8687	2.8585	-	25.1060	2.8052	1.7873
4th Quintile, 1992 to 1996											
Mean	0.0000	0.0000	0.0000	-0.0528	-0.0000	-0.0000	-0.0000	-0.0000	-0.0316	0.0000	-0.0467
S.D.	0.9996	0.9972	0.9958	0.9946	0.9970	0.9961	0.9977	1.0000	0.0227	0.9900	0.9907
Skew.	-0.2723	-0.3171	-0.0870	0.2808	-0.1408	-0.1548	-0.1326	4.6949	0.0000	-0.2510	-0.5360
Kurt.	9.3622	4.1361	1.9882	1.8106	2.1514	3.1634	2.9650	23.0417	1.0000	3.5172	3.1566
Smallest Quintile, 1992 to 1996											
Mean	-0.0000	0.0000	-0.0000	-0.0000	0.0000	0.0000	-0.0755	0.3813	-0.0000	-0.0000	0.0000
S.D.	0.9996	0.9974	0.9973	0.9981	0.9980	0.9956	0.9103	0.9137	1.0000	0.9910	0.9939
Skew.	-0.9395	0.5020	0.0904	0.4828	0.3605	0.6016	-0.2653	-0.5807	4.0069	0.1653	-0.2408
Kurt.	19.8401	3.0603	3.7947	3.0529	2.7932	1.9999	2.3047	1.3670	17.0556	2.4217	2.9588

Note that in all three cases the summary statistics vary considerably not only between the normalized one-day raw and post-pattern returns, but also among the post-pattern returns of different pattern types. For example, from Table 5 we can see that the values of mean, standard deviation, skewness, and kurtosis are 0.0000, 0.9995, 0.0602, and 16.1842 for the raw returns, −0.0004, 0.9881, 0.2300, and 3.2339 for the post-RBOT returns, and −0.0000, 0.9795, −0.3785, and 4.0120 for the post-BBOT returns. The extent of the variation is even more evident from Table 6, where the above statistics read 0.2646, 0.9452, 1.1689, and 7.1029 for post-BTOP returns, −0.0134, 0.4360, 9.0572, and 86.7438 for post-BBOT returns, and −0.0120, 0.9815, −0.2553, and 2.7013 for post-DBOT returns. These differences constitute a preliminary evidence that conditioning on technical patterns does affect the distribution of returns, a proposition that shall be more formally examined in the rest of this thesis.

3.5.3 Empirical results

This more formal study starts with the analysis of of the goodness-of-fit diagnostics for our sample of Nasdaq stocks from 1992 to 1996 and for each type of technical patterns considered. For each pattern, we first compute the percentage of conditional returns that falls within each of the 10 unconditional-return deciles. If conditioning on the pattern provides no information, the expected percentage falling in each decile is 10%. In other words, we consider the null hypothesis that, for a particular pattern, the proportion of post-pattern returns in decile j, denoted by p_j, equals 0.1, with the alternative that the null hypothesis is not true, and report the asymptotic z-statistics and their associated p-values. We then consider the null hypothesis that $p_i = p_j \forall i, j \in [1, 10]$, with the alternative that the null hypothesis is not true, and report the associated χ^2 goodness-of-fit statistics Q. As before, we repeat this procedure for each of the three cases under consideration: Tables 7 to 9 refer to the case where the pattern recognition algorithm employs a lower degree of smoothing, the case where it is based on a higher degree of smoothing, and the case where where the lower degree of smoothing is coupled with the breaking of the neckline requirement, respectively.[15]

[15]In particular, in each of the tables 7 to 9, we present goodness-of-fit diagnostics for the conditional one-day normalized returns, for a sample of 25 Nasdaq stocks from 1992 to 1996 (5 stocks per size-quintile). For each pattern, the percentage of conditional returns that falls within each of the 10 unconditional-return deciles is tabulated in the first row. If conditioning on the pattern provides no information, the expected percentage falling in each decile is 10%. Asymptotic z-statistics for this null hypothesis, and the associated p-values are also reported. The χ^2 goodness-of-fit test statistics Q are reported in the last column.

Table 3.7: Goodness-of-fit diagnostics for the conditional one-day normalized returns, for a sample of 25 Nasdaq stocks from 1992 to 1996, where neural networks with a **lower degree of smoothing** were employed.

		Decile										
Pattern		1	2	3	4	5	6	7	8	9	10	Q
HS	$\hat{\delta}_j$	15.5	9.1	7.1	8.7	6.3	14.9	5.9	8	9.9	14.7	
	z	13.755	-2.256	-7.254	-3.273	-9.332	12.251	-10.394	-5.042	-0.310	11.853	692
	p	0.0000	0.0241	0.0000	0.0011	0.0000	0.0000	0.0000	0.0000	0.7569	0.0000	
IHS	$\hat{\delta}_j$	10.4	13.5	8.7	7.5	13.4	10.5	6	4.7	12.4	12.8	
	z	0.778	6.983	-2.493	-4.919	6.701	2.076	-7.852	-10.390	4.671	5.460	312.4
	p	0.4363	0.0000	0.0127	0.0000	0.0000	0.0379	0.0000	0.0000	0.0000	0.0000	
TTOP	$\hat{\delta}_j$	15.1	6.6	7.8	4.1	11.2	17.2	6	7.6	11.5	13	
	z	9.347	-6.302	-4.075	-10.816	2.245	13.200	-7.445	-4.376	2.727	5.495	496.9
	p	0.0000	0.0000	0.0000	0.0000	0.0248	0.0000	0.0000	0.0000	0.0064	0.0000	
TBOT	$\hat{\delta}_j$	10.7	12.2	10.6	3.4	13.1	15.6	7.8	1.8	8.8	16	
	z	1.189	3.975	1.003	-11.876	5.585	10.043	-3.889	-14.663	-2.217	10.848	579.6
	p	0.2345	0.0001	0.3158	0.0000	0.0000	0.0000	0.0001	0.0000	0.0266	0.0000	
RTOP	$\hat{\delta}_j$	13.7	7.9	6.8	6.8	8.1	23.7	5.9	5.6	8.7	13	
	z	10.585	-6.017	-9.039	-9.196	-5.467	38.648	-11.708	-12.532	-3.740	8.466	1996.1
	p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	
RBOT	$\hat{\delta}_j$	13.4	8.4	4.3	3.4	12.1	24.7	3.3	7.6	10.1	12.7	
	z	11.017	-4.989	-18.287	-21.030	6.607	46.883	-21.343	-7.767	0.427	8.482	3377.3
	p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.6693	0.0000	
BTOP	$\hat{\delta}_j$	13.7	16	4.7	1.3	6.3	18.8	5.9	0	16.7	16.6	
	z	4.811	7.849	-6.920	-11.393	-4.811	11.562	-5.401	-13.166	8.777	8.693	696.9
	p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
BBOT	$\hat{\delta}_j$	13.8	14.3	6.8	3.6	7.7	16.9	3.4	7.5	13.6	12.4	
	z	5.629	6.382	-4.756	-9.422	-3.401	10.219	-9.723	-3.702	5.253	3.522	403.2
	p	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000	0.0002	0.0000	0.0004	
DTOP	$\hat{\delta}_j$	15.4	9.9	5.9	1.9	9.1	20.3	3.6	8	16.6	9.3	
	z	5.559	-0.098	-4.232	-8.256	-0.968	10.562	-6.516	-2.056	6.755	-0.751	290.1
	p	0.0000	0.9220	0.0000	0.0000	0.3330	0.0000	0.0000	0.0398	0.0000	0.4529	
DBOT	$\hat{\delta}_j$	14.5	11.8	3.8	11.6	2.8	13.5	9.2	7.7	11.3	14	
	z	4.639	1.841	-6.448	1.625	-7.416	3.563	-0.850	-2.357	1.302	4.101	145.5
	p	0.0000	0.0657	0.0000	0.1041	0.0000	0.0004	0.3951	0.0184	0.1928	0.0000	

Table 3.8: Goodness-of-fit diagnostics for the conditional one-day normalized returns, for a sample of 25 Nasdaq stocks from 1992 to 1996, where pattern recognition was done using a **higher degree of smoothing**.

		Decile										
Pattern		1	2	3	4	5	6	7	8	9	10	Q
HS	$\hat{\delta}_j$	12	13.2	8.8	7	8.2	14	4.7	8.2	10.9	13	
	z	1.799	2.893	-1.118	-2.699	-1.605	3.622	-4.886	-1.605	0.827	2.771	63.5851
	p	0.0720	0.0038	0.2634	0.0070	0.1086	0.0003	0.0000	0.1086	0.4085	0.0056	
IHS	$\hat{\delta}_j$	10.2	9.4	15.2	4.5	9.1	15.4	2.2	17.3	5.1	11.6	
	z	0.177	-0.414	3.875	-4.111	-0.710	4.023	-5.886	5.502	-3.668	1.213	115.7795
	p	0.8591	0.6788	0.0001	0.0000	0.4778	0.0001	0.0000	0.0000	0.0002	0.2252	
TTOP	$\hat{\delta}_j$	10.8	11.6	7.9	7.2	7.3	18.8	6.1	7.4	10.7	12.3	
	z	0.769	1.648	-2.088	-2.857	-2.747	8.902	-3.956	-2.638	0.659	2.308	117.8913
	p	0.4417	0.0993	0.0368	0.0043	0.0060	0.0000	0.0001	0.0084	0.5097	0.0210	
TBOT	$\hat{\delta}_j$	13.5	8.6	6.5	5	9.4	22.9	7.9	6	7.3	12.9	
	z	3.356	-1.340	-3.402	-4.891	-0.538	12.519	-2.027	-3.860	-2.600	2.783	215.1606
	p	0.0008	0.1802	0.0007	0.0000	0.5904	0.0000	0.0426	0.0001	0.0093	0.0054	
RTOP	$\hat{\delta}_j$	15.6	8.7	5.6	5.8	8.4	21.8	6.1	6.8	8.1	13.1	
	z	5.509	-1.264	-4.312	-4.086	-1.603	11.604	-3.861	-3.183	-1.829	3.025	217.7936
	p	0.0000	0.2061	0.0000	0.0000	0.1090	0.0000	0.0001	0.0015	0.0674	0.0025	
RBOT	$\hat{\delta}_j$	14.1	8.8	2.7	11.1	8.7	20.6	8.4	5.3	8.5	11.8	
	z	4.929	-1.416	-8.865	1.343	-1.600	12.837	-1.968	-5.646	-1.784	2.1706	285.9087
	p	0.0000	0.1567	0.0000	0.1794	0.1096	0.0000	0.0491	0.0000	0.0744	0.0300	
BTOP	$\hat{\delta}_j$	10.8	6.8	18.4	5.2	9.7	17.8	1.7	6.6	8.3	14.7	
	z	0.630	-2.448	6.348	-3.621	-0.249	5.908	-6.260	-2.595	-1.275	3.562	139.4990
	p	0.5284	0.0144	0.0000	0.0003	0.8032	0.0000	0.0000	0.0095	0.2022	0.0004	
BBOT	$\hat{\delta}_j$	12	6.9	6.2	10.2	7.2	17.3	13.9	6	8.5	11.8	
	z	1.582	-2.478	-3.038	0.182	-2.198	5.781	3.122	-3.178	-1.218	1.442	71.6067
	p	0.1137	0.0132	0.0024	0.8556	0.0280	0.0000	0.0018	0.0015	0.2233	0.1493	
DTOP	$\hat{\delta}_j$	12.5	7.8	8.5	5.9	6.4	18.6	12.9	6.6	9.7	11	
	z	2.058	-1.784	-1.235	-3.294	-2.882	6.999	2.333	-2.745	-0.274	0.823	81.7288
	p	0.0395	0.0744	0.2168	0.0010	0.0040	0.0000	0.0197	0.0061	0.7837	0.4103	
DBOT	$\hat{\delta}_j$	14.3	9.4	7	2.6	14.7	13	10.9	7.5	4.7	15.8	
	z	3.313	-0.448	-2.329	-5.656	3.602	2.300	0.709	-1.895	-4.065	4.470	96.7024
	p	0.0009	0.6538	0.0199	0.0000	0.0003	0.0214	0.4784	0.0581	0.0000	0.0000	

Table 3.9: Goodness-of-fit diagnostics for the conditional one-day normalized returns, for a sample of 25 Nasdaq stocks from 1992 to 1996, where **breaking of the neckline** condition and a lower degree of smoothing were used.

		Decile										
Pattern		1	2	3	4	5	6	7	8	9	10	Q
HS	$\hat{\delta}_j$	11.9	6.9	9.4	9.2	12.4	15.9	3.8	7.7	8.7	14	
	z	3.435	-5.542	-0.991	-1.490	4.245	10.604	-10.966	-4.046	-2.363	7.113	332.1
	p	0.0006	0.0000	0.3216	0.1362	0.0000	0.0000	0.0000	0.0001	0.0181	0.0000	
IHS	$\hat{\delta}_j$	10	11.1	12.4	5.2	8.9	15.3	6.3	4.6	13.8	12.4	
	z	0.053	1.628	3.580	-7.077	-1.673	7.857	-5.501	-7.977	5.606	3.505	240.9
	p	0.9581	0.1034	0.0003	0.0000	0.0942	0.0000	0.0000	0.0000	0.0000	0.0005	
TTOP	$\hat{\delta}_j$	12.4	15.6	5.9	5.4	8.4	18.7	3.9	2.8	14.1	12.9	
	z	4.147	9.493	-6.937	-7.915	-2.699	14.774	-10.327	-12.348	6.950	4.864	697.2
	p	0.0000	0.0000	0.0000	0.0000	0.0070	0.0000	0.0000	0.0000	0.0000	0.0000	
TBOT	$\hat{\delta}_j$	11.8	12.2	14.1	1.5	9.7	10.5	2.4	8.5	16.6	12.7	
	z	3.032	3.696	6.887	-14.253	-0.558	0.838	-12.658	-2.553	11.009	4.561	524.9
	p	0.0024	0.0002	0.0000	0.0000	0.5765	0.4022	0.0000	0.0107	0.0000	0.0000	
RTOP	$\hat{\delta}_j$	15	9.8	5.7	6.2	8.5	16.1	5.3	10.5	9.2	13.7	
	z	9.324	-0.309	-7.980	-7.088	-2.807	11.406	-8.872	0.880	-1.558	7.005	422.9
	p	0.0000	0.7571	0.0000	0.0000	0.0050	0.0000	0.0000	0.3788	0.1192	0.0000	
RBOT	$\hat{\delta}_j$	13	9.6	9.5	3.6	6.1	19.1	12.1	4.1	9.9	13	
	z	6.573	-0.866	-1.070	-14.012	-8.611	19.922	4.535	-12.942	-0.153	6.624	850.0
	p	0.0000	0.3864	0.2846	0.0000	0.0000	0.0000	0.0000	0.0000	0.8785	0.0000	
BTOP	$\hat{\delta}_j$	0	24.7	0	0	28.2	1.2	0	0	27.1	18.8	
	z	-3.073	4.519	-3.073	-3.073	5.604	-2.712	-3.073	-3.073	5.242	2.712	127.1
	p	0.0021	0.0000	0.0021	0.0021	0.0000	0.0067	0.0021	0.0021	0.0000	0.0067	
BBOT	$\hat{\delta}_j$	0	0	0	0	18.8	80.2	0	0	0	1	
	z	-3.266	-3.266	-3.266	-3.266	2.858	22.930	-3.266	-3.266	-3.266	-2.926	555.5
	p	0.0011	0.0011	0.0011	0.0011	0.0043	0.0000	0.0011	0.0011	0.0011	0.0034	
DTOP	$\hat{\delta}_j$	15.4	9.9	5.9	1.9	9.1	20.3	3.6	8	16.6	9.3	
	z	5.559	-0.098	-4.232	-8.256	-0.968	10.562	-6.516	-2.056	6.755	-0.751	290.1
	p	0.0000	0.9220	0.0000	0.0000	0.3330	0.0000	0.0000	0.0398	0.0000	0.4529	
DBOT	$\hat{\delta}_j$	14.5	11.8	3.8	11.6	2.8	13.5	9.2	7.7	11.3	14	
	z	4.639	1.841	-6.448	1.625	-7.416	3.563	-0.850	-2.357	1.302	4.101	145.4
	p	0.0000	0.0657	0.0000	0.1041	0.0000	0.0004	0.3951	0.0184	0.1928	0.0000	

We note that, on average, the values of the Q statistic are the greatest for the case with the lower degree of smoothing, where they range form 145.5 to 3377.3 (Table 7), and the least for the case with the higher degree of smoothing, where they range from 63.6 to 285.9 (Table 8). The case pertaining to the lower degree of smoothing coupled with the inclusion of the breaking of the neckline condition into the pattern definition is, on average, in the middle, its Q values ranging from 127.1 to 850.0 (Table 9). Such large values of Q bring us to conclude that the relative frequencies of the post-pattern returns are significantly different from those of the raw returns for each of the ten technical patterns and in each of the three cases under consideration. Moreover, the magnitude of this significance is overwhelming, which is precisely the conclusion that Lo, Mamaysky, and Wang drew from their kernel regression based analysis.

We further observe that, as we move from Table 7 to Table 9 to Table 8, the frequency counts of most patterns decline, as do their Q values. This suggests that some of the differences observed in these tables may be explained by the differences in the power of the test due to different sample sizes. For example, since the case with the highest degree of smoothing has the lowest frequency counts of patterns, the corresponding test statistics are subject to greater sampling variation and lower power for those patterns, hence the lowest Q values. This explanation is plausible for the BTOP patters as well, even though the value of their Q statistic rises as we move from Table 9 to Table 8, since their corresponding frequency counts also rise. However, the above reasoning cannot be applied to understand the way TTOP and BBOT formations behave as we move from Table 7 to Table 9, where the Q values increase even though the frequency counts for these patterns decrease (in the instance of BBOT patterns dramatically so). This seems to indicate that including the breaking of the neckline condition in the definitions of TTOP and BBOT patterns has an important effect on their information content. Here we have found yet another aspect in which the triangle and the broadening formations behave similarly, highlighting, once again, the need for a future investigation of their relationship and of the type of nonlinearities that they model.

Tables 10 to 12 report the results of the Kolmogorov-Smirnov test of the equality of the post-pattern and unconditional return distributions for all the stocks from our sample, from 1992 to 1996. Table 10 refers to the case where the pattern recognition algorithm employs a lower degree of smoothing, Table 11 relates to the case where it employs a higher degree of smoothing, while Table 12 concerns the case where the lower degree of smoothing is coupled with the breaking of the neckline requirement. The following statistics are reported in each table: (1) $D_{m,n} = \sup_{-\infty<x<\infty}|F_m(x) - G_n(x)|$, where F_m and G_n are sample distribution functions calculated from m observed values of the conditional returns and n observed values of the unconditional returns, (2) $\gamma_{m,n} = \sqrt{\frac{mn}{m+n}}D_{m,n}$, which, under the null hypothesis that $F = G$, should be small, and (3) p-values with respect to the asymptotic distribution of the Kolmogorov-Smirnov test statistic given by $\gamma_{m,n}$. In each table, statistics are reported in three ways: (1) unconditional of volume, (2) conditioned on decreasing volume trend ($'\tau(\searrow)'$), and (3) conditioned on increasing volume trend ($'\tau(\nearrow)'$).

Table 3.10: Kolmogorov-Smirnov test for the equality of distributions of conditional and unconditional one-day normalized returns for all the stocks and over the entire time frame of our sample (1992-1996), where neural networks with a **lower degree of smoothing** were employed in the pattern recognition algorithm. In the top horizontal portion of the table, the conditional distibution is conditioned on the occurence of one of the 10 technical patterns under consideration; in the second horizontal portion of the table, the conditional distribution is conditioned on both the occurence of one of the 10 technical patterns and increasing volume trend ($\tau(\nearrow)$); in the third horizontal portion of the table, the conditional distribution is conditioned on both the occurence of one of the 10 technical patterns and decreasing volume trend ($\tau(\searrow)$). In the bottom horizontal portion of the table, we test for the difference between the increasing and decreasing volume-trend distributions.

Statistic	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
ks-stat	0.0711	0.0730	0.1157	0.1030	0.0997	0.1193	0.1350	0.0894	0.1132	0.0777
γ	4.8188	4.0278	6.0305	5.2381	7.4242	9.7332	5.1673	3.8087	3.4024	2.3600
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ks-stat $\tau(\nearrow)$	0.0817	0.0642	0.1699	0.1463	0.1170	0.1073	0.1724	0.0851	0.1307	0.1215
$\gamma\ \tau(\nearrow)$	3.5496	2.2725	5.1551	4.3995	5.7962	5.8888	4.0581	2.2596	2.2760	1.6008
p-value $\tau(\nearrow)$	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0108
ks-stat $\tau(\searrow)$	0.0909	0.0905	0.0955	0.0867	0.0776	0.1389	0.0999	0.1156	0.1538	0.1405
$\gamma\ \tau(\searrow)$	4.2391	3.0964	3.4135	2.8972	4.0253	8.0652	2.4579	3.1723	2.7792	3.0379
p-value $\tau(\searrow)$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ks-stat diff.	0.0495	0.0670	0.1157	0.0927	0.0817	0.0754	0.1921	0.0742	0.1324	0.1819
γ diff.	1.6454	1.9545	3.0248	2.4082	2.9179	2.8307	4.1121	1.7528	2.1836	2.3231
p-value diff.	0.0085	0.0062	0.0000	0.0002	0.0000	0.0000	0.0000	0.0301	0.0067	0.0003

Table 3.11: Kolmogorov-Smirnov test for the equality of the conditional and unconditional one-day return distributions for all the stocks and over the entire time frame of our sample, where pattern recognition was accomplished using a **higher degree of smoothing**. In the top horizontal portion of the table, the conditional distibution is conditioned on the occurence of one of the 10 technical patterns under consideration; in the second horizontal portion of the table, the conditional distribution is conditioned on both the occurence of one of the 10 technical patterns and increasing volume trend ($\tau(\nearrow)$); in the third horizontal portion of the table, the conditional distribution is conditioned on both the occurence of one of the 10 technical patterns and decreasing volume trend ($\tau(\searrow)$). In the bottom horizontal portion of the table, we test for the difference between the increasing and decreasing volume-trend distributions.

Statistic	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
ks-stat	0.0770	0.0623	0.0586	0.0942	0.1092	0.0972	0.1131	0.0850	0.0937	0.1001
γ	2.0790	1.3887	1.7438	2.6955	3.1689	3.4307	2.5443	2.0000	2.2496	2.2815
p-value	0.0003	0.0405	0.0043	0.0000	0.0000	0.0000	0.0000	0.0006	0.0001	0.0001
ks-stat $\tau(\nearrow)$	0.1033	0.1222	0.1312	0.0817	0.0950	0.0870	0.0623	0.0930	0.1091	0.0906
$\gamma\ \tau(\nearrow)$	1.7832	1.5596	2.0345	1.2883	1.6644	2.0314	0.9032	1.2805	1.5024	1.0608
p-value $\tau(\nearrow)$	0.0032	0.0140	0.0004	0.0685	0.0072	0.0005	0.3776	0.0708	0.0201	0.2002
ks-stat $\tau(\searrow)$	0.0653	0.0740	0.0826	0.0955	0.1001	0.1084	0.0773	0.1250	0.1140	0.0980
$\gamma\ \tau(\searrow)$	1.1627	1.0549	1.6895	1.7915	2.0069	2.4589	1.0327	1.9975	1.7433	1.5627
p-value $\tau(\searrow)$	0.1288	0.2073	0.0062	0.0030	0.0006	0.0000	0.2271	0.0006	0.0041	0.0140
ks-stat diff.	0.0896	0.1073	0.1119	0.0979	0.1151	0.0652	0.0990	0.1120	0.0689	0.0959
γ diff.	1.1178	1.1181	1.3156	1.1620	1.4470	0.9311	1.1181	1.2260	0.7543	0.9423
p-value diff.	0.1559	0.2310	0.0384	0.1116	0.0169	0.1926	0.2817	0.1187	0.6824	0.3637

Table 3.12: Kolmogorov-Smirnov test for the equality of the conditional and unconditional one-day return distributions for all the stocks and over the entire time frame of our sample, where the definitions of HS, IHS, TTOP, TBOT, RTOP, RBOT, BTOP, and BBOT patterns include the **breaking of the neckline** condition, and where a lower degree of smoothing is used. In the top horizontal portion of the table, the conditional distibution is conditioned on the occurence of one of the 10 technical patterns under consideration; in the second horizontal portion of the table, the conditional distribution is conditioned on both the occurence of one of the 10 technical patterns and increasing volume trend ($\tau(\nearrow)$); in the third horizontal portion of the table, the conditional distribution is conditioned on both the occurence of one of the 10 technical patterns and decreasing volume trend ($\tau(\searrow)$). In the bottom horizontal portion of the table, we test for the difference between the increasing and decreasing volume-trend distributions.

Statistic	HS	IHS	TTOP	TBOT	RTOP	RBOT	BTOP	BBOT	DTOP	DBOT
ks-stat	0.0714	0.0878	0.0929	0.1089	0.0836	0.1059	0.3289	0.4689	0.1132	0.0777
γ	3.6067	3.7482	4.5078	5.1965	4.4072	6.3783	3.0269	4.5846	3.4024	2.3600
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ks-stat $\tau(\nearrow)$	0.0921	0.1234	0.1589	0.1149	0.0796	0.0778	0.3836	0.4897	0.1307	0.1215
$\gamma\ \tau(\nearrow)$	2.8896	3.3986	4.4056	3.2425	2.7186	3.0518	1.1507	3.1328	2.2760	1.6008
p-value $\tau(\nearrow)$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1065	0.0000	0.0001	0.0108
ks-stat $\tau(\searrow)$	0.0674	0.1642	0.0876	0.1197	0.0753	0.1049	0.4645	0.5100	0.1538	0.1405
$\gamma\ \tau(\searrow)$	2.2737	4.1219	2.9298	3.7572	2.5939	4.1696	3.1816	2.4446	2.7792	3.0379
p-value $\tau(\searrow)$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ks-stat diff.	0.0970	0.1998	0.1475	0.1077	0.0625	0.0870	0.5437	0.5907	0.1324	0.1819
γ diff.	2.2774	4.3439	3.2199	2.3783	1.5373	2.2866	1.6251	3.7188	2.0687	2.2474
p-value diff.	0.0001	0.0000	0.0000	0.0000	0.0152	0.0000	0.0135	0.0000	0.0067	0.0003

Tables 10 to 12 show that all the patterns are statistically significant at the 5 percent level in all three cases under consideration. The values of the γ statistic are, on average, the greatest for the case with the lower degree of smoothing, where they range from 2.3600 to 9.7332 (Table 10), and the least for the case with the higher degree of smoothing, where they range from 1.3887 to 3.4307 (Table 11). In the intermediate case of the lower degree of smoothing coupled with the inclusion of the breaking of the neckline condition in the definitions of first eight patterns, γ ranges from 2.3600 to 6.3783. We observe that for all pattern types with the exception of BTOP, the drop in the value of γ is coupled with the drop in the frequency count, which leads us to conclude that a lack of power of the Kolmogorov-Smirnov test due to small sample sizes might account for some of the reductions in statistical significance observed as we move across tables.

In the case of BTOP patterns, γ and the frequency count move in the opposite directions, with γ decreasing from 3.0269 to 2.5443 as we move from Table 12 to Table 11, and the frequency count increasing from 85 to 517. This suggests that the statistical significance of BTOP formations is especially significant in Table 12, since there the Kolmogorov-Smirnov test is likely to have lower power; hence, including the breaking of the neckline condition in the definitions of BTOP patterns may be important.

When we also condition on increasing volume trend, the statistical significance declines for most patterns in all three cases, the only exception being the TTOP pattern in Table 11. Conditioning on decreasing volume trend yields an increase in the significance of IHS and BTOP patterns in Table 12, as well as of DBOT patterns in Table 10. The difference between increasing and decreasing volume-trend conditional distributions is statistically significant for all the patterns in the lower degree of smoothing case, regardless of whether or not we require the patterns to break the neckline before we consider them complete. On the contrary, except for TTOP and RTOP patterns, the Kolmogorov-Smirnov test cannot distinguish between the decreasing and increasing volume-trend conditional distributions in the case with a higher degree of smoothing. This might suggest that conditioning on volume may be more important in very short-term, day to day trading, which is the situation corresponding to the lower degree of smoothing.

3.6 Monte Carlo Analysis

Finally, in Tables 13 to 15, we report the bootstrap percentiles for the Kolmogorov-Smirnov test of the equality of conditional and unconditional one-day return distributions under the null hypothesis of equality, both for all the stocks from our sample from 1992 to 1996, and in size quintiles. Table 13 refers to the case where the pattern recognition algorithm employs a lower degree of smoothing, Table 14 relates to the case where it employs a higher degree of smoothing, while Table 15 concerns the case where the lower degree of smoothing is coupled with the breaking of the neckline requirement. For each of these three cases we scan the frequency counts reported in Tables 1 to 3 and search for their maximum and minimum values, which we denote m_1 and m_2, respectively.[16] We then perform 1000 Monte Carlo

[16]We also require that both m_1 and m_2 are greater than one.

iterations in each of which we (1) construct a bootstrap sample of size m_1 and another of size m_2 by resampling, with replacement, the one-day normalized returns, and (2) compute the Kolmogorov-Smirnov test statistic against the entire sample of one-day normalized returns. We also report the percentiles of the asymptotic distribution, for comparison.

These tables reveal that although the bootstrap distribution of the Kolmogorov-Smirnov statistic is, overall, close to its asymptotic distribution across size quintiles, degrees of smoothing, and for a wide range of sample sizes, there are some important differences among the three cases under consideration. Namely, the bootstrap distribution of the Kolmogorov-Smirnov statistic is best approximated by its asymptotic counterpart in the case with a high degree of smoothing (Table 14), and worst approximated in the case with a low degree of smoothing (Table 13). This suggests that the neural network model characterized by a low degree of smoothing, which we have implemented because it was selected by professional technicians, suffers from overfitting. It probably just so happened that the technicians we interviewed were agressive short-term traders, who sought to exploit even the shortest-horizon technical patterns. Models with fewer nodes in the hidden layer may better capture the kind of nonlinearities that a broader range of technical analysts is looking for.

3.7 Conclusion

In this chapter, we revisited the kernel regression based pattern recognition algorithm designed by Lo, Mamaysky, and Wang (2000) to extract nonlinear patterns from the noisy price data, and developed an analogous neural network based one. We argued that, given the natural flexibility of neural network models and the extent of parallel processing that they allow, our algorithm was a step forward in the automation of technical analysis. More importantly, following the approach proposed by Lo, Mamaysky, and Wang, we applied our neural network based model to examine empirically the ability of the patterns under consideration to add value to the investment process. We discovered overwhelming support for the validity of these indicators, just like Lo, Mamaysky, and Wang did. Moreover, we found this basic conclusion to remain valid across different levels of smoothing and insensitive to the nuances of pattern definitions present in the technical analysis literature. This confirms that Lo, Mamaysky, and Wang's results are not an artifact of their kernel regression model, and suggests that the kinds of nonlinearities that technical indicators are designed to capture constitute some underlying properties of the financial time series itself. In this thesis, we attempted to gain insight into the nature of these foundations by studying the relationships between patterns, but hope to investigate this issue further in future research.

Table 3.13: Bootstrap percentiles for the Kolmogorov-Smirnov test, under the null hypothesis of equality, and where **lower degree of smoothing** was used.

m_1	m_2	percentile	asym.	$D_{m_1,n}$	$\gamma_{m_1,n}$	$D_{m_2,n}$	$\gamma_{m_2,n}$
All Stocks, 1992 to 1996							
9217	939	0.0100	0.4410	0.0047	0.3799	0.0138	0.4139
9217	939	0.0500	0.5200	0.0055	0.4460	0.0160	0.4804
9217	939	0.1000	0.5710	0.0059	0.4852	0.0176	0.5297
9217	939	0.5000	0.8280	0.0088	0.7159	0.0262	0.7868
9217	939	0.9000	1.2240	0.0131	1.0660	0.0395	1.1860
9217	939	0.9500	1.3580	0.0145	1.1844	0.0437	1.3134
9217	939	0.9900	1.6280	0.0166	1.3548	0.0529	1.5890
Largest Quintile, 1992 to 1996							
3016	89	0.0100	0.4410	0.0073	0.3086	0.0462	0.4311
3016	89	0.0500	0.5200	0.0090	0.3806	0.0541	0.5054
3016	89	0.1000	0.5710	0.0100	0.4220	0.0594	0.5544
3016	89	0.5000	0.8280	0.0145	0.6122	0.0860	0.8032
3016	89	0.9000	1.2240	0.0216	0.9092	0.1289	1.2036
3016	89	0.9500	1.3580	0.0240	1.0114	0.1397	1.3043
3016	89	0.9900	1.6280	0.0298	1.2554	0.1722	1.6082
2nd Quintile, 1992 to 1996							
2357	159	0.0100	0.4410	0.0088	0.3461	0.0346	0.4293
2357	159	0.0500	0.5200	0.0104	0.4120	0.0400	0.4963
2357	159	0.1000	0.5710	0.0115	0.4530	0.0434	0.5376
2357	159	0.5000	0.8280	0.0166	0.6556	0.0646	0.8010
2357	159	0.9000	1.2240	0.0243	0.9605	0.0933	1.1561
2357	159	0.9500	1.3580	0.0273	1.0771	0.1049	1.3001
2357	159	0.9900	1.6280	0.0313	1.2340	0.1282	1.5887
3rd Quintile, 1992 to 1996							
1494	126	0.0100	0.4410	0.0116	0.3914	0.0361	0.4004
1494	126	0.0500	0.5200	0.0136	0.4598	0.0441	0.4888
1494	126	0.1000	0.5710	0.0149	0.5018	0.0481	0.5335
1494	126	0.5000	0.8280	0.0208	0.7024	0.0700	0.7754
1494	126	0.9000	1.2240	0.0305	1.0297	0.1025	1.1361
1494	126	0.9500	1.3580	0.0336	1.1355	0.1142	1.2655
1494	126	0.9900	1.6280	0.0417	1.4081	0.1355	1.5009
4th Quintile, 1992 to 1996							
1749	203	0.0100	0.4410	0.0097	0.3483	0.0304	0.4248
1749	203	0.0500	0.5200	0.0119	0.4259	0.0346	0.4828
1749	203	0.1000	0.5710	0.0131	0.4705	0.0378	0.5275
1749	203	0.5000	0.8280	0.0195	0.7000	0.0564	0.7873
1749	203	0.9000	1.2240	0.0292	1.0469	0.0844	1.1778
1749	203	0.9500	1.3580	0.0330	1.1806	0.0942	1.3145
1749	203	0.9900	1.6280	0.0395	1.4163	0.1199	1.6736
Smallest Quintile, 1992 to 1996							
1367	225	0.0100	0.4410	0.0113	0.3718	0.0280	0.4121
1367	225	0.0500	0.5200	0.0138	0.4562	0.0334	0.4908
1367	225	0.1000	0.5710	0.0153	0.5060	0.0369	0.5418
1367	225	0.5000	0.8280	0.0220	0.7272	0.0541	0.7958
1367	225	0.9000	1.2240	0.0333	1.1005	0.0806	1.1840
1367	225	0.9500	1.3580	0.0373	1.2307	0.0901	1.3248
1367	225	0.9900	1.6280	0.0465	1.5363	0.1116	1.6405

Table 3.14: Bootstrap percentiles for the Kolmogorov-Smirnov test, under the null hypothesis of equality, and where **higher degree of smoothing** was used.

m_1	m_2	percentile	asym.	$D_{m_1,n}$	$\gamma_{m_1,n}$	$D_{m_2,n}$	$\gamma_{m_2,n}$
All Stocks, 1992 to 1996							
1314	508	0.0100	0.4410	0.0120	0.4225	0.0186	0.4145
1314	508	0.0500	0.5200	0.0143	0.5043	0.0225	0.5012
1314	508	0.1000	0.5710	0.0157	0.5531	0.0247	0.5509
1314	508	0.5000	0.8280	0.0228	0.8046	0.0360	0.8024
1314	508	0.9000	1.2240	0.0335	1.1826	0.0530	1.1814
1314	508	0.9500	1.3580	0.0369	1.3017	0.0580	1.2933
1314	508	0.9900	1.6280	0.0439	1.5505	0.0730	1.6288
Largest Quintile, 1992 to 1996							
383	11	0.0100	0.4410	0.0217	0.4065	0.1247	0.4132
383	11	0.0500	0.5200	0.0249	0.4677	0.1406	0.4658
383	11	0.1000	0.5710	0.0283	0.5302	0.1551	0.5139
383	11	0.5000	0.8280	0.0408	0.7646	0.2338	0.7745
383	11	0.9000	1.2240	0.0620	1.1635	0.3507	1.1617
383	11	0.9500	1.3580	0.0699	1.3099	0.3879	1.2850
383	11	0.9900	1.6280	0.0812	1.5234	0.4607	1.5261
2nd Quintile, 1992 to 1996							
442	108	0.0100	0.4410	0.0205	0.4120	0.0404	0.4149
442	108	0.0500	0.5200	0.0243	0.4890	0.0481	0.4937
442	108	0.1000	0.5710	0.0264	0.5302	0.0536	0.5501
442	108	0.5000	0.8280	0.0381	0.7658	0.0758	0.7788
442	108	0.9000	1.2240	0.0577	1.1585	0.1155	1.1866
442	108	0.9500	1.3580	0.0655	1.3145	0.1299	1.3348
442	108	0.9900	1.6280	0.0763	1.5321	0.1563	1.6060
3rd Quintile, 1992 to 1996							
286	84	0.0100	0.4410	0.0259	0.4252	0.0473	0.4302
286	84	0.0500	0.5200	0.0304	0.4988	0.0555	0.5044
286	84	0.1000	0.5710	0.0321	0.5272	0.0624	0.5673
286	84	0.5000	0.8280	0.0484	0.7947	0.0891	0.8094
286	84	0.9000	1.2240	0.0716	1.1768	0.1339	1.2163
286	84	0.9500	1.3580	0.0796	1.3073	0.1490	1.3540
286	84	0.9900	1.6280	0.0989	1.6257	0.1786	1.6232
4th Quintile, 1992 to 1996							
308	145	0.0100	0.4410	0.0257	0.4365	0.0356	0.4229
308	145	0.0500	0.5200	0.0292	0.4960	0.0422	0.5005
308	145	0.1000	0.5710	0.0318	0.5403	0.0468	0.5557
308	145	0.5000	0.8280	0.0465	0.7914	0.0680	0.8070
308	145	0.9000	1.2240	0.0695	1.1822	0.1002	1.1890
308	145	0.9500	1.3580	0.0774	1.3161	0.1109	1.3157
308	145	0.9900	1.6280	0.0929	1.5811	0.1315	1.5606
Smallest Quintile, 1992 to 1996							
210	16	0.0100	0.4410	0.0296	0.4209	0.0985	0.3935
210	16	0.0500	0.5200	0.0344	0.4886	0.1205	0.4812
210	16	0.1000	0.5710	0.0382	0.5438	0.1319	0.5267
210	16	0.5000	0.8280	0.0565	0.8036	0.1978	0.7902
210	16	0.9000	1.2240	0.0846	1.2035	0.2931	1.1707
210	16	0.9500	1.3580	0.0932	1.3247	0.3290	1.3142
210	16	0.9900	1.6280	0.1115	1.5851	0.3990	1.5936

Table 3.15: Bootstrap percentiles for the Kolmogorov-Smirnov test, under H_0 of equality of distributions, and with **lower degree of smoothing** and the **breaking of the neckline**.

m_1	m_2	percentile	asym.	$D_{m_1,n}$	$\gamma_{m_1,n}$	$D_{m_2,n}$	$\gamma_{m_2,n}$
All Stocks, 1992 to 1996							
4280	85	0.0100	0.4410	0.0067	0.4060	0.0464	0.4267
4280	85	0.0500	0.5200	0.0079	0.4744	0.0542	0.4985
4280	85	0.1000	0.5710	0.0086	0.5211	0.0600	0.5524
4280	85	0.5000	0.8280	0.0125	0.7517	0.0885	0.8145
4280	85	0.9000	1.2240	0.0186	1.1191	0.1354	1.2459
4280	85	0.9500	1.3580	0.0205	1.2348	0.1479	1.3615
4280	85	0.9900	1.6280	0.0243	1.4657	0.1744	1.6046
Largest Quintile, 1992 to 1996							
1332	89	0.0100	0.4410	0.0119	0.3798	0.0437	0.4083
1332	89	0.0500	0.5200	0.0141	0.4487	0.0517	0.4828
1332	89	0.1000	0.5710	0.0155	0.4927	0.0569	0.5311
1332	89	0.5000	0.8280	0.0222	0.7085	0.0857	0.7999
1332	89	0.9000	1.2240	0.0334	1.0654	0.1321	1.2338
1332	89	0.9500	1.3580	0.0372	1.1853	0.1440	1.3442
1332	89	0.9900	1.6280	0.0453	1.4438	0.1664	1.5538
2nd Quintile, 1992 to 1996							
1011	26	0.0100	0.4410	0.0133	0.3839	0.0795	0.4043
1011	26	0.0500	0.5200	0.0161	0.4627	0.0951	0.4833
1011	26	0.1000	0.5710	0.0174	0.4997	0.1061	0.5394
1011	26	0.5000	0.8280	0.0259	0.7466	0.1605	0.8159
1011	26	0.9000	1.2240	0.0368	1.0585	0.2348	1.1937
1011	26	0.9500	1.3580	0.0421	1.2131	0.2590	1.3170
1011	26	0.9900	1.6280	0.0494	1.4227	0.3167	1.6101
3rd Quintile, 1992 to 1996							
715	47	0.0100	0.4410	0.0167	0.4161	0.0598	0.4080
715	47	0.0500	0.5200	0.0193	0.4805	0.0725	0.4945
715	47	0.1000	0.5710	0.0210	0.5244	0.0799	0.5453
715	47	0.5000	0.8280	0.0301	0.7504	0.1207	0.8233
715	47	0.9000	1.2240	0.0444	1.1071	0.1821	1.2422
715	47	0.9500	1.3580	0.0483	1.2052	0.2036	1.3891
715	47	0.9900	1.6280	0.0593	1.4789	0.2418	1.6498
4th Quintile, 1992 to 1996							
871	4	0.0100	0.4410	0.0141	0.3817	0.1981	0.3961
871	4	0.0500	0.5200	0.0169	0.4591	0.2319	0.4637
871	4	0.1000	0.5710	0.0184	0.5005	0.2511	0.5021
871	4	0.5000	0.8280	0.0270	0.7336	0.3774	0.7544
871	4	0.9000	1.2240	0.0414	1.1249	0.5694	1.1384
871	4	0.9500	1.3580	0.0459	1.2474	0.6274	1.2542
871	4	0.9900	1.6280	0.0536	1.4550	0.7263	1.4521
Smallest Quintile, 1992 to 1996							
1052	19	0.0100	0.4410	0.0132	0.3905	0.0935	0.4069
1052	19	0.0500	0.5200	0.0155	0.4600	0.1105	0.4810
1052	19	0.1000	0.5710	0.0170	0.5040	0.1229	0.5347
1052	19	0.5000	0.8280	0.0248	0.7374	0.1781	0.7748
1052	19	0.9000	1.2240	0.0359	1.0653	0.2639	1.1484
1052	19	0.9500	1.3580	0.0394	1.1707	0.2877	1.2518
1052	19	0.9900	1.6280	0.0469	1.3926	0.3449	1.5009

Chapter 4

A Brief History of Technical Analysis

4.1 Introduction

Technical analysis can be fully appreciated only when a scientific investigation is accompanied by a historical one. Since technical analysis has its roots in trading and speculation, a historical study of the former should be paralleled by a historical study of the latter. With this in mind, we start with a brief overview of the main trends in the ancient Near Eastern trade from the Stone Age to the Iron Age, and summarize the evolution of the market economy of the ancient Mediterranean form its birth in the Iron Age to its climax in the Roman Empire. We then follow the commercial developments of Western Europe through the Middle Ages, Renaissance, and Industrial Revolution, before focusing our attention on the history of Wall Street, which is where the American version of technical analysis was born at the turn of the nineteenth century, and where it has continued to flourish to this day. We next study China, where markets can be traced back thousands of years ago, and uncover striking similarities between commercial practices of the late imperial period and present-day technical analysis. To gain insight into the universal nature of technical analysis, we highlight the striking similarities between the American variation of the discipline and its older and arguably more progressive counterpart, the Japanese one. Finally, we conclude our historical section with a review of not only the most controversial, but also the oldest branch of technical analysis: financial astrology.

4.2 Commerce in the Ancient Near East

4.2.1 Neolithic

The earliest evidence of extensive trading activity dates back to the late pre-ceramic Neolithic – the period when the settled village life began and plants and animals were domesticated – and is found in the Jordan Valley. A distinction between local and long-distance trade is apparent, the former referring to the exchange of resources between the nomads and the

villagers of the Jordan Valley settlements,[1] and the latter comprising of a network that connected the Jordan Valley with the Central Anatolian Plateau and the Zagros-Taurus arc.[2] [113, pp. 57-62]

During the ceramic phases of the Neolithic, the subsistence techniques (e.g. irrigation) were improved, and settled life became more established. The remnants of fully settled farming villages and small seasonal nomadic encampments have been found in lower and higher elevations of the Zagros Valley, respectively. The local movement of goods was in the form of the exchange of goods produced by the nomads, such as clarified butter, wool, lambskins, and livestock, and the goods produced by the agricultural villages, such as grain, flour, fruit, vegetables, and craft items. Since there is no evidence of market structures in the Zagros during the sixth millennium B.C., it is believed that the exchange between the nomads and their parent villages took place along the blood-relationship lines. The long distance trade continued to grow slowly, with new materials being added to the trade network.[3] [113, pp. 62-67]

In the later ceramic Neolithic, around 5000 B.C., first large and specialized settlements came into being, including towns with temples and possibly markets, irrigation-farming villages lacking temples, dry-farming villages, pastoral camps in caves, and villages specializing in the production of a particular raw material or craft item.[4] In addition, nomadic encampments continued into this phase, with nomadism developing into a full-time occupation. The local trade declined – the local movement of goods was mainly in the form of redistribution of goods through the temple, rather than in the form of trade – but did not cease altogether. On the other hand, the long distance trade flourished like never before. The trade network, which grew to include an "impressive" variety of raw materials, extended 1500 miles from the major sites in northern Mesopotamia to the lapis mines in Afganistan.[5] [113]

4.2.2 Bronze Age

The urbanization process culminated during the early Bronze Age. A myriad of small, disunited city-states emerged, only to be consolidated into empires ruled by a single king.[6] The first Mesopotamian empire was established by Sargon the Great in the twenty-fourth century B.C., with its capital at Agade.[7] All aspects of life in the empire, including the economic ones, revolved around religion, and the merchant, though free to pursue his private commercial activities, was primarily an agent of the temple [89, p. 49]. When later, starting with the Old Akkadian Dynasty and ending with the Third Dynasty of Ur, the political

[1]The nomads would collect salt, bitumen, and sulfur from the shores of the Dead Sea, and exchange them for the villagers' farming products.

[2]The main object of the long-distance trade was Central Anatolian obsidian.

[3]Alabaster, marble, cinnabar, wood, limestone, greenstone, and iron oxides are among the new materials that entered the long-distance trade.

[4]One such village was Tilki Tepe, which specialized in the preparation of obsidian for trade. For more examples, please see [113, p. 71].

[5]For a list of raw material used, please see [113, p. 70].

[6]Please see [63, p. 67] and [89, p. 48].

[7]For a description of Sargon's expansionist efforts, please see [85, pp. 270-271].

power became increasingly more concentrated in secular rather than religious institutions, the merchant extended his services to both the temple and the palace, never once abandoning his role as a private entrepreneur [89, p. 50]. Furthermore, the earliest written evidence of Mesopotamian overland trade dates back to the early Bronze Age. Sumerian epic literature, including the *Epic of Gilgamesh*, abounds in the allusions to the commercial reality of this period. [98, pp. 237-238]

After the fall of the last one of these empires, the Third Dynasty of Ur, at around 2000 B.C., the societal organization shifted back to a multitude of decentralized city-states, each ruled by its own king. However, the role of a king was largely ceremonial, and the city state was, in effect, run by the businessmen, who established trading colonies in Anatolia. [90, p. 23] Each colony was headed by a man appointed by the king, and inhabited by the representatives of private companies headquartered in the parent city-state. The latter, who usually were male relatives of the principal businessmen, conducted business with the Anatolian regions. Though primarily an outlet for private profit-making opportunities, the colonies had some obligations toward the palace, such as selling the produce received as tax and produced in its sector, and supplying it with commodities it needed from abroad [95, p. 49]. The most important such colony was Karum Kanesh in Anatolia, a possession of the city-state of Ashur [90, p. 26].

In the ensuing Old Babylonian period, trade was in the hands of *takamaru*, who acted as merchants, brokers, merchant bankers, money-lenders, or government agents. *Takamaru* dealt in slaves, foodstuffs, wool, timber, garments, textiles, grain, wine and ale, metals, building materials, and cattle and horses. Rather than going on the road themselves, they preferred to hire agents, loan them money, and send them on trading journeys; the code of conduct between the *takamarum* and his agents was spelled out by king Hammurabi.[8] [98, pp. 246-247] Furthermore, by this time the idea of interest was already present and surprisingly modern.[9]

During the following period, the late Bronze Age, the sociopolitical organization of the ancient Near East became more rigid. A number of larger regional units, governed by the 'great kings,' and subordinate local units, governed by the 'small kings,' emerged, greatly restricting both the overland trade and the sea trade [95, p. 67]. In effect, any commercial activity was limited to the adjacent regions, among which the political relations were formally established. Merchants belonged to the palace, and their private activities were minimal. [95, pp. 67-69]

4.2.3 Iron Age

In contrast to the large palace-towns of the Bronze Age, the settlements of the Iron Age were not palace-centered. They were small, diffuse, and numerous, and extended into the previously unpopulated far-away planes, hills, and deserts. This expansion was possible

[8]Hammurabi (ca. 1795 - 1750 B.C.) is a celebrated Babylonian king and law-maker. Though his code of laws is not the earliest such document, it is the best preserved and the most important.

[9]A large number of tablets which pose textbook-like interest rates problems and provide their solutions date back to the second millennium B.C. [50, pp. 6-7].

thanks to the technological improvements, such as the domesticated dromedary, an improved system for holding water, and the iron metallurgy. [95, pp. 70-71] Both the overland trade and the sea trade benefited enormously from the removal of political barriers and the related expansion of settlements and decentralization of power, as well as from the new technology. Merchants became freer, both in their business activities and in their physical movement. An Iron Age merchant was no longer an agent of the palace who engaged in private enterprise only as a side interest; now he was active mainly for his own profit and stimulated not by royal orders but by perceived market advantages. Moreover, he was no longer limited to the adjacent regions in his operations, but ventured far and away, often coming into close contact with the resident populations. [95, pp. 72-73]

4.3 Commerce in the Ancient Mediterranean

4.3.1 Hellenistic Age

By the middle of the first millennium B.C., a new type of economy was born in the ancient Mediterranean: the market-oriented one. Several factors contributed to its development. First, unlike the irrigation-based agriculture of the ancient Near East, the Mediterranean rainwater-based agriculture required little higher-level control, and allowed more individual initiative. Second, during the Iron Age, cheap iron tools became available to peasants and artisans, leading to a market expansion. Third, unlike the ancient Near East, which, due to its geographic location, had to rely on costly land transportation, the ancient Mediterranean had ready access to cheaper sea transportation, which was made even cheaper by the improvements in ship building brought about by the Iron Age. [29, pp. 90-91]

The Iron Age also gave rise to the improvements in warfare technique, thereby inducing great migrations of peoples at the end of the second millennium B.C. Among the migrating peoples were the Dorian tribes from the north, who completely destroyed the old Mycenaean-Minoan culture of Greece. During the settlement of Dorians in Greece, a highly uncentralized and divided regime emerged, consisting of a multitude of tribal groupings headed by the chiefs. These tribal groupings later broke up into nuclear families, giving rise to a household system of production. [29, pp. 97-98] What ensued was "the breakup of the solidarity based upon real or fictional kinship and of the common property of the kin," and the society became divided into "the possessors of land and a dependent or even landless peasantry" [29, p. 101]. The desire and the need for more land led to colonization, which lasted from the mid-eight to the mid-fifth century, and during which Greeks expanded to the western Mediterranean, the northern Aegean and the Black Sea, and Africa and Egypt [29, p. 102]. Different regions specialized in different products, and had to trade among themselves to obtain the ones they did not produce.[10] Significant trade was also done with Barbarian princes who had a taste luxuries. Soon, one could distinguish between two types of trade: *kapeleia*, or retail trade, which was land-borne, and *emporia*, or wholesale trade, which was sea-borne [49, p. 288].

[10]For example, Egypt specialized in grain production, while the Agean specialized in manufactures and finer agricultural goods, such as oils and scents, wine, or wool cloth [29, p. 108].

The earliest evidence of coins comes from the Lydian capital of Sardis, and dates back to around 650 B.C. [29, p. 108]. By the fifth century B.C., the use of coinage in Greece, who borrowed the idea from the Lydians, became widespread, and the bank emerged as "the indispensable organ of trade" [49, p. 303]. The first banks were temples that accepted individual and state deposits, and lent them out at interest. As banks passed from temples into private hands, they came to serve the following main functions: (1) the accumulation of wealth in money, (2) the transfer of wealth by means of credit and checks, and (3) the allocation of funds for investment [29, p. 159]. Needless to say, along with the development of banks emerged the profession of banking.[11] By the fourth century B.C., banking and trade became tightly tied; it is precisely this union that "gave a sudden impulse to speculation," suggests Gustave Glotz, an authoritative historian of the ancient world [49, p. 306]. The development of speculative activities even caught the attention of Aristotle, who wrote about *chrematistichè*, or the art of getting rich [78, p. 9].

The rapid development of trade and coinage widened the gap between the rich and the poor, prompting the Athenian law-maker Solon (ca. 638 - 558 B.C.) and the Greek statesman and tyrant Pisistratus (ca. 607 - 528 B.C.) to introduce economic reforms favoring the poor in general, and the Athenian small farmer in particular. Soon, Athenian farmers started specializing in a particular crop (e.g. olives) and producing primarily for export, and the Athenian economy, "an economy of small farmers," became centered around domestic and international markets [29, p. 115]. Pisistratus instituted new festivals, such as the popular Great Duinysia, and undertook public constructions, such as the great temple to Olympian Zeus [29, p. 119]. Festivals, new constructions, demand for luxuries by the barbarian princes, and farm product exports, all required full-time services of professional artisans and merchants, leaving them with no time to grow their own food and hence dependent on the produce market for their livelihood [29, p. 120]. As Davisson and Harper explain, "for the first time in history, there appeared an urban class that made its living on the market, that needed to buy and sell in order to live"[12] [29, p. 120].

In the fourth and third centuries B.C., the Greek culture spread to southwestern Asia and northeastern Africa, including Mesopotamia, Egypt, and Italy. This process of Hellenization was at first peaceful, then characterized by Alexander of Macedonia's fierce conquests. As a result, the Mediterranean culture became more unified and the trade more open. [28, p. 80] More precisely, as the new Hellenistic market economy replaced the Athenian one, it "created a far larger area of trade in which the market replaced the port of trade and for the first time really integrated the ancient Near East with the Greek world," write leading economic historians, Davisson and Harper [29, p. 151]. Circulation of money stimulated local trade by augmenting people's purchasing power, while further specialization of agricultural production gave rise to numerous interregional markets, such as those between the corn countries and the oil or wine countries. Commercial associations and partnerships were

[11] Please see [49, p. 304] for details regarding the first bankers.

[12] However, the Athens' was not the first such market - that of the Lydian capital of Sardis [29, p. 120] and that of Corinth [39, p. 88] certainly preceded it. Nevertheless, as Davisson and Harper explain, "if this innovation did not first take place at Athens, it was first truly visible to us there, and it was through Athens that this innovation reached the rest of the Mediterranean world" [29, p. 121].

frequent, the organization of credit highly elaborate, and means of communication and transport significantly improved.[13] In such an environment the art of speculation reached new heights of creativity and sophistication, its most famous example being the wheat corner planned around the year 330 by Cleomenes.[14]

4.3.2 Roman Age

Further economic integration of the region came after the Roman conquest, which, as Davisson and Harper put it, "created an economic unity out of this vast region and endowed it with the institutions of the market economy" [29, p. 173]. Corporate organization, industrial insurance, and joint-stock companies became widespread, as did the practice of selling shares or *partes* to the public in order to raise capital [106, p. 3]. The economy peaked during the peaceful and prosperous Augustan Age (c. 43 B.C. - 18 A.D.), which enjoyed market-oriented agricultural production, an increase in the demand for luxuries, more regular issue of Roman coinage, extremely low interregional custom barriers, and blossoming international trade, particularly with the East.[15] The business class, also known as *equites*, grew into "the most powerful force" of the Roman Age; in fact, as Robert Sobel, a prolific business historian points out, "commerce was so vital to Rome that its disruption was an important cause of her decline" [106, p. 3].

4.4 Commerce in Western Europe

4.4.1 Middle Ages

Following the disintegration of the Roman Empire in the fourth and fifth centuries, the European world sank deep into the turbulent and uncivilized Dark Ages. Society became organized in self-sufficient isolated little villages, also known as manors, and commercial activity, having become largely unnecessary, dwindled to a minimum [30, pp. 34-35]. The magnificence that was Roman culture disappeared, giving way to people who, in the words of Clive Day, a noted economic historian, were "coarse and ignorant, with little regard for personal cleanliness or for moral laws, and with practically no interests outside the narrow bounds of the little village in which they lived" [30, p. 36].

Then, in the latter part of the Middle Ages, after the year 1000, the situation changed dramatically. This reversal was due to the emergence of towns and the rise of a manufacturing class, whose livelihood of depended on the trade of wares for food with the surrounding countryside [30, p. 41]. It was trade and the closely related financial activity that pulled Europe out of the pangs of backwardness and inertia, and bestowed it with movement, cultural flourish, and economic prosperity. Merchants and bankers emerged as potent agents of change and driving forces of civilization that, in the words of Armando Sapori, a prominent

[13]For more detailed description of these developments, please see [49, pp. 362-371].

[14]For a description of this corner, please see [29, p. 151].

[15]Please see [29, pp. 202-206] or [115] for more details.

scholar of Italian history, "[traced] for individuals and peoples of all times to come the only way that leads to a full realization of humanity" [99, p. 38].

Medieval merchants came in two varieties: the traveling and the sedentary ones. Among traveling traders, peddlers emerged as the least sophisticated kind. They usually traveled alone, carrying a wide variety of commodities on their back, on a horse, or in a wagon. Somewhat more sophisticated were the traveling merchants who dealt in raw materials, food, livestock, manufactures, and eastern imports. To protect their goods, they frequented the fairs traveling in armed groups rather than individually. More sophisticated still were sedentary merchants or city businessmen. As the name suggests, sedentary merchants were stationed at a city office or a warehouse, while their partners and agents traveled and handled business abroad. [54, pp. 162-164]

The merchant's close associate was the banker. Initially a simple money-changer, he frequented the fairs where he used to erect his *banca* (bench or table) and exchange local coins for the foreign ones. He later started handling deposits, lending deposited and his own money, and allowing depositors to withdraw money with prior notice. Depositors were awarded with interest or a share of any profit a banker made on their money. Bankers also began transferring money from one man's account to that of another. [54, p. 179] Furthermore, bills of exchange came into use as early as the thirteenth century; it was then that the Italian merchants started writing out the bills to each other instead of dealing in cash, having found them more convenient and less costly for handling large transactions [93, p. 117]. Though in the early stages of capitalism banking was tightly connected with trade, in the fourteenth and fifteenth centuries the money business was becoming more and more purely financial and speculative [24, p. 328]. As commercial practices grew increasingly complex, the need for more advanced banking and accounting methods was becoming urgent. The adoption of Arabic numbers in the twelfth century was a big step forward, as it tremendously simplified all calculations. In the fourteenth century, double-entry bookkeeping was developed in Italy from where it spread to northern Europe. [25, p. 80]

Just like in the ancient civilizations, where the market activity flourished during religious festivals, with worshippers buying gifts to offer to their gods, so in the early medieval Europe much buying and selling took place in the churchyards after Sunday services [54, p. 169]. However, this practice did not last long, with the Church soon rising against the desecration of holy places. Consequently, markets had to be held weekdays on specifically designated marketplaces where carts could be parked, benches could be erected, and goods could be stored; town streets or town squares served this purpose well [25, p. 50]. "Thickly sprinkled over the country," individual markets served the towns in which they were located and a small area of the surrounding countryside [54, p. 168]. As towns grew larger, markets became twice or three times weekly events, with different hours of the market day reserved for different articles, and market halls were built to protect the goods from bad weather. Hence, with time, local markets were becoming better and better established and came to constitute "one of the most important elements of the basic urban framework." [24, p. 303]

Somewhat different in nature were the fairs, which, rather than serving local population,

constituted periodic meeting places for distant traders. Held yearly or half-yearly in small sleepy towns, they lasted several days or even weeks, and dealt in wholesale rather than retail business. The most famous among the fairs were the Champagne ones, their golden age running from 1150 to 1300. The Champagne fairs played an important role in the development of credit, with people buying or borrowing at one fair and promising to pay or repay at a later one, and guaranteeing their promise with a *lettre de foire* (a fair letter). [54, p. 171]

A dominant force in the medieval mentality, religion penetrated deeply all levels of life, including the economic ones. The Church's position on commerce can be summed up by invoking two main economic doctrines that it preached: the doctrine of just price and the prohibition of usury. According to the former, it was wrong to sell a thing for more than it was worth, and, according to the latter, it was wrong to charge purely for the use of money loaned or advanced [25, p. 68]. Needless to say, these religious principles were difficult for merchants to uphold; even when ideologically they were close to the Church, they were simply humans, and, as such, vulnerable to the emotions of greed and fear, and constantly tempted to speculate.

Their speculative instincts thrived especially at the fairs; it was at the fairs, where "men strove continuously to maximize profits and business expanded without set limits in cut-throat economic competition," that capitalism started to take root [24, p. 311]. In its early stages, from 1300 to 1500, merchants learned to circumvent the dominant Christian ethic by resorting to many tricks which allowed them to "obey the letter of the canons but not their spirit" [24, p. 311]. For example, bills of exchange enabled medieval merchants to circumvent Church's prohibition of usury, since a bill purchased at a price lower than its face value was said to reflect the risk that it may not be honored when presented, rather than interest. With time, however, the Church gradually started to admit "that prices were linked to the laws of supply and demand; and with regard to interest they tempered the rigor of their doctrine with considerations based on the idea of risk, of injury to the creditor, and even of missed opportunities for profit" [24, p. 311].

4.4.2 Renaissance

By 1660, Europeans had discovered the New World and the route to the Far East around the Cape of Good Hope [88, p. 244]. The West was also penetrating into Russia and other Slavic lands. "To no other society in history had a whole world been opened for its exploitation," writes Frederick Nussbaum, a noted historian, in his book, *The Triumph of Science and Reason* [88, p. 245]. Naturally, such expansion had profound socioeconomic consequences. The discovery of the distant lands not only extended European markets overseas, but also incited national rivalries among the European nation-states, which had replaced the myriad of medieval provinces, dukedoms, and city-states at the beginning of the sixteenth century. Competition flourished as each nation-state sought to strenghten its economy and thereby consolidate its position at home and abroad.

Also ideologically, in 1660 Europe was in revolution; "at no time in its brief history as a society had any generation stood to the future with an orientation so distinct from that of

its ancestors," explains Nussbaum [88, p. 1]. Whereas for two thousand years since the time of the ancient Greeks the purpose of natural science was to serve religion, in the seventeenth century its purpose became to master, by observation and measurement, the material world, which was assumed to be rational and distinct from the world of God. In fact, Renaissance is often referred to as the Age of Reason, and numerous great scientific and philosophical achievements are associated with it.[16] Two geniuses stand out in particular: Descartes and Newton. From *cogito, ergo sum* as his starting point, Descartes defined a Universe with man alone at its center. His 1637 text, *Discours sur la méthode de bien conduire la raison et chercher la vérité dans les sciences*, came to define the Cartesian system and the European mind for the centuries to come. No less momentous is Isaac Newton's *Philosophiae naturalis principia mathematica*, published in 1687 by the Royal Society. [88, p. 2]

Just as the scientific revolution of the Renaissance put emphasis on the individual, so the Protestant Reformation of the sixteenth century "supplied the merchant class with both a highly individualized moral responsibility outside the control of its clergy and with moral dogmas that emphasized exactly the thrift, industry, honesty, and promise keeping needed for capitalist institutions," explain Rosenberg and Birdzell in their book, *How the West Grew Rich* [93, p. 133]. In other words Protestantism, particularly of the Calvinistic sort, provided a moral system that was more suitable than the Catholic ethics for the rise of capitalism. In effect, Calvinism led to secularization of business in the sixteenth and seventeenth centuries, allowing it to grow independent from the intervention of religious authorities. As Rosenberg and Birdzell put it, "religion was gradually transformed from a restraining influence upon capitalist development to a force that both sanctioned and supported mercantile capitalism by precisely the moral teachings required for the smooth running of the rising commercial system" [93, p. 132].

Further stimuli to the renaissance economy came form the unprecedented expansion in population and the associated urbanization process. The towns that prospered commercially grew in population. Soon, a changing pattern of urbanism emerged, with the old towns (Venice, Florence, Milan, Lisbon, Antwerp) declining and the new ones (Amsterdam, London, Paris) flourishing. Even the new European towns in the midst of wilderness – Lima and Mexico, Panama and Acapulco, New York and Boston - showed signs of urbanization during this period. [88, pp. 203-206] In fact, "*growth in trade* and *urbanization* are nearly equivalent expressions," according to Rosenberg and Birdzell [93, p. 80]. At the time when communications were slow, conducting business based on ties other than kinship was "inherently urban" in nature, since it required a community of knowledgeable and skilled individuals gathered in a single urban market [93, p. 139]. The existence of a single urban market led, in turn, to the development of trading institutions, such as, for example, the maritime insurance markets of Italy, Amsterdam, and London. The maritime insurance markets constituted a vehicle for separation of risk between the perils of the sea (storms, pirates) and the perils of the market (the cargo might not bring profit as high as expected), and, as such, encouraged trading activity. Moreover, as the volume of contracts and conflicts about them in trading centers grew, development of commercial law and commercial courts

[16] A summary of the great scientific achievements of this period can be found in [88, pp. 20-24].

became imminent. [93]

Growth of towns put an enormous pressure on local markets. While in the Middle Ages it was customary for peasants to bring their produce to local markets to meet the local demand, in the Age of Renaissance it became customary for middlemen of all sorts to seek out peasants at their homes and buy up their produce for speculation and consumption [88, pp. 207-208]. Soon, permanent markets or exchanges replaced the periodic fares that flourished in the Middle Ages.[17] Among these new establishments, the Exchange of Amsterdam is best known.

As early as the mid-sixteenth century, there had been speculation in grain futures in Amsterdam, though the earliest list of price quotations from the Exchange dates back to 1585 [7, p. 74]. By the early seventeenth century, herring, spices, whale-oil, and grain were objects of speculative trading [7, p. 74]. Around the same time purely financial speculation in company shares began,[18] including transactions in options and futures; as Violet Barbour, the historian of Amsterdam capitalism, puts it, "one sees that without possessing actions or even a desire to acquire any, one can carry on a big business in them ... the seller, so to speak, sells nothing but wind and the buyer receives only wind" [7, pp. 78-79]. It is not only the sheer volume of speculation, but also the sophistication of its expertness, that stands out about the Bourse of Amsterdam. Speculative techniques were abstract, ingenious, and modern, indeed; a spectacular description is provided by Joseph de la Vega's 1688 text entitled *Confusion de Confusiones: Dialogos Curiosos entre un Philosopho Agudo, un Mercador Discreto y un Accionista Erudito, descriviendo el Negocio de las Acciones.* One of the most interesting examples of speculation, the so called tulip mania, occurred in the opulent city of Amsterdam in 1633-37.[19]

In addition to the exchanges, markets for trading bills of exchange emerged and came to dominate the renaissance economic landscape. Lesser-known merchants started depositing funds with better-known ones with the purpose of drawing on their better-known colleagues when paying by bills of exchange. Those who accumulated such assets realized that only a fraction of the funds needed to be available for withdraws, while the rest could be used to buy bills of exchange at a discount, that is, to lend money at interest. [93, p. 117] It did not take long for deposit banks to become a defining feature of the renaissance economy. The Bank of Amsterdam, founded in 1609, became a leader of European finance and credit [88, p. 215]. Whether they lowered the transaction costs, encouraged individuals to save and invest, or provided businessmen with the bank credit and increased the supply of capital available to the merchant class, all such banks fueled economic growth.[20]

The ever-growing renaissance economy necessitated an expansion in the money supply

[17]In his 1681 book entitled *Le Nouveau Négociant*, Samuel Ricard defines the exchange, also known as the bourse, as a "meeting-place of bankers, merchants and businessmen, exchange currency dealers and bankers' agents, brokers and other persons" [10, p. 97].

[18]The shares of great companies, the *Oost-Indische Compagnie* (the East India Company), founded in 1602, and the *West-Indische Compagnie* (the West India Company), founded in 1621, were among those quoted on the Exchange.

[19]For detailed description of the tulip mania, please see [91].

[20]Please see [88, pp. 214-215] or [103, p. 8].

if it were to maintain itself. This was not a problem thanks to Europe's ability to take advantage of the riches of the New World. Much of the precious metals supply flowed through Spain to the rest of Western Europe, as Spain appropriated gold and silver from the Aztecs and the Incas, and exploited silver mines of Mexico and Peru [103, p. 6]. As a consequence of the inflow of precious metals and also due to the fact that kings of that time were often debasing the coins, the price level doubled or tripled throughout Western Europe. This rise in prices, which is known as *the price revolution*, was preceded by a hundred years of stationary or falling prices. Many economic historians believe that in the wake of the price revolution, production costs lagged behind selling prices, thereby making merchants and manufacturers better off.[21] In any event, the price revolution reduced the costs of exchanging goods and services. That facilitated the transition from barter to money economy, and led to redistribution of wealth in favor of the merchant class. Merchants and businessmen who, incidentally, were the class most inclined to save and invest, further increased their wealth by investing in great joint-stock companies.[22] [103, p. 7]

4.4.3 Industrial Revolution

Moving into the Industrial Revolution, the first thing that comes to mind is the shift from the artisan's shop to the factory system of production. This was made possible by a number of technological advances. The most important of the inventions was the steam engine, which not only revolutionized land and water transportation, but also, when applied to the printing press and together with the invention of the telegraph and the laying of the Atlantic cable in 1859, revolutionized communications [93, p. 151].

An inevitable consequence of the advances in transport and communications was the decline of fairs. This decline was quickened by the growth of commercial integrity and honesty, and the improvements in commercial methods. In particular, introduction of standardization, the prearranged system to name and classify different kinds and qualities of goods, eliminated the need on the part of consumers to personally inspect the goods they were buying, allowing them to purchase based on a sample or a description. The decline of fairs was gradual, and it spread from west to east. [9, p. 51]

The fairs gave way to produce markets, exchanges, or bourses, as they are variously known. Unlike their predecessors, the produce markets were not limited to specified weeks of the year, but were open on a daily basis. Most of the transactions took place without the goods being physically present, and buyers and sellers, rather than haggling over the actual goods, engaged in abstract speculation of all kinds. Produce markets were usually specialized – for example, there were cotton, woolen, sugar, coal, iron, grain, rubber, and tea exchanges, to name a few – and the membership was restricted to a small group of people. [9, pp. 51-53]

The produce exchange supplied consumers with raw materials, rather than with finished manufactured articles. The latter had to be obtained through a myriad of intermediaries,

[21] Though, as economic historians Scoville and La Force point out, this hypothesis has not been universally accepted [103, p. 7].

[22] In the second half of the seventeenth century, the stock companies became common.

such as the wholesale merchants, retail dealers, and commercial travelers. The last-named are of exceptional significance. Acting as "stimuli" or "nerves in the human body," they "[provoked] demand and [made] supply effective," thus providing "one of the most essential links in the ever-lengthening chain of middlemen which [stretched] between the producer and the consumer," writes a distinguished economic historian, Arthur Birnie [9, p. 53]. It is for this reason that Birnie assigns to them "a most important position in the modern commercial system" [9, p. 53]. Commercial travelers or 'bagmen,' came to existence in the early nineteenth century. Shrewd and energetic, they traveled between exchanges by a horse-drawn carriage, a railway, or a motorcar. These "great ambasadors of Parisian history," as Balzac once called them, were immortalized by the said author in his 1833 piece *L'Illustre Gaudissart* (*The Illustrious Gaudissart*).

While craftsmen's shops were a common feature of European towns since the Middle Ages, at the close of the eighteenth century a different kind of shop - the one kept by a dealer in commodities rather than by a producer - came to dominate the urban landscape of Western Europe. For example, there was in Paris, near Pont-Neuf, a retail shop called *Little Dunkirk*, which sold "French and foreign merchandize and every novelty produced by the arts" [9, p. 54]. These new modern retail shops started out as small general stores, but then, in the first half of the nineteenth century, became specialized. Later yet, in the second half of the nineteenth century, the small retail shop was overtaken by its giant counterparts – the large and the multiple shop. Both of these retail giants undermined the weekly market and the small shopkeeper. By the 1890s, the large shop of the universal provider type was present in all important towns of Europe; for example, there were *Whiteley's* and *Selfridge's* in London, and *Wertheim* and *Leonhard* in Berlin. [9, pp. 54-56]

Despite the enormous pressure exerted by the retail giants on the small shopkeeper, the latter did not disappear altogether as he had certain advantages. Namely, the small shopkeeper tended to pay special attention to the particular tastes and wants of his customers, and was usually located within their easy reach. Similarly, the weekly market, which was already in decline since the coming of the fair, experienced the pressure, but did not become extinct. Rather, it adapted to the new market conditions by specializing in goods that, being hard to standardize, required personal inspection by traders, such as fresh food-stuffs, fish, fruit, and vegetables. [9]

Moreover, as a result of the nineteenth century railway revolution and the accompanying advances in communications, the market for chief staples became worldwide in the following sense. First of all, railways and steamships meant that the produce exchange could obtain supplies from a wide geographical area, which, in the case of the chief staples like grain, rubber, and cotton, was the whole world. Secondly, coming of a telegraph smoothed out the price variation across the exchanges, as it enabled them to communicate with each other with minimum delay. As Birnie points out, this "establishment of world markets in the chief branches of trade is one of the most important commercial developments" of the nineteenth century. [9, p. 53]

Banks participated in the process of industrialization in a variety of ways. Most obviously, they served as intermediaries between borrowers and lenders, and provided short-term credit

for working capital, thereby allowing industrialists to devote more of their own resources to fixed investment. In addition, banks supplied industrial enterprises with long-term loans and even bought their stocks; however, this was not their major function, since, given that they had to maintain a high degree of liquidity, banks could tie up only a small portion of their funds in long-term commitments. [18, p. 134]

More notably, banks provided the rapidly growing economy with an increased supply of the means of payment. Namely, in the eighteenth, nineteenth, and early twentieth centuries, banking institutions issuing money substitutes rose parallel with the rise of industry, first in England and Scotland, then on the continent of Western Europe and in North America [18]. This was significant for two main reasons. First of all, as an economy grows, its need for money also grows, and, in the case of rapidly industrializing economies, the money supply must grow much more rapidly than the total national product [18, p. 134]. Secondly, industrialization induced large shifts in the flow of resources from agriculture to secondary and tertiary sectors and from the declining industries, like handicrafts, to modern, mechanized ones. This transition required the expansion in the volume of money and money substitutes that would render the economy "more buoyant and responsive, more susceptible to changes in the pattern of resource deployment" [18, p. 136]. In fact, the increase in the means of payment that banks provided, "constituted one of their most important contributions to economic development," writes a leading economic historian, Rondo Cameron [18, p. 135].

However, the eighteenth century economic growth was not without difficulties - the overly restrictive commercial policy proved its major obstacle. Internal custom barriers or tariff walls burdened the domestic markets of continental European countries,[23] while the foreign trade was hampered by a nationalist commercial system known as *mercantilism*[24] [9, p. 61]. The change came about in the form of Adam Smith and his 1776 text, *The Wealth of Nations*. Adam Smith advocated international division of labor as opposed to national self-sufficiency, firmly held that a man only can live by finding out what other men want, and strongly opposed the State intervention.[25] Smith's thinking was in agreement with the individualism and optimism characteristic of the eighteenth century philosophy; this won him readier acceptance, thereby starting a movement towards greater commercial freedom and allowing the competitive spirit to thrive. [9, pp. 65-66] It was precisely this "substitution of competition for the mediaeval regulations" that Arnold Toynbee called the "essence" of the Industrial Revolution[26] [108, p. 11].

[23]Britain was the only European country that in the eighteenth century enjoyed free trade. That greatly contributed to her superior economic development in the later part of the eighteenth century. [9]

[24]The mercantalists believed that commerce was a kind of a war between nations where one could benefit only at the expense of others. Strong supporters of the State intervention, they held that it was the duty of the government to direct economic activities so as to maximize the national wealth [9, p. 62].

[25]Smith's doctrine of *laisser-faire* is well-known.

[26]Arnold Toynbee formulated the classic statement of the industrial revolution in a series of lectures given in 1880-1881, which remain influential to this day.

4.5 History of Wall Street and the Rise of the Western Brand of Technical Analysis

4.5.1 Origins of the Street

The first European settlement of New York dates back to 1621, when the Dutch colonists established the colony of New Netherlands with New Amsterdam as its capital [26, p. 10]. It was the Dutch who first laid out Wall Street. Namely, soon after settling down, they put up a brush fence along where Wall Street would shortly run, to keep hogs and goats in the city and to discourage the attacks by the Native Americans [51, p. 10]. The "practical and unpretentious" town of New Amsterdam was blessed with "the largest and finest harbor of North Atlantic" [51, p. 28]. Thanks to the Dutch emphasis on fair trade, New Amsterdam became the crossroads of commercial routes connecting Europe with the riches of the New World, and truly "the perfect spot for traders and merchants" [26, p. 10].

In contrast, England's North American colonies were mainly agricultural. The early colonists were predominantly farmers who were attracted to the New World by the abundance of good, cheap land; most of the time manufacturing, mining, and entrepreneurship were nothing more but their side interests. People tended to reinvest most of their surplus earnings into family enterprises, leaving just a little for speculation in land or English bonds.

Soon, the English settlers of New England began to "covet the little settlement located in the middle of so splendid a harbor" [51, p. 10]. In addition to the Native American tribes, the citizens of New Amsterdam now had to fight a new enemy: their British neighbors. Consequently, Peter Stuyvesant, the governor of New Netherlands, decided that the brush barrier was no longer adequate and that a proper wall was required to deter the British invaders. Hence, in 1653, he replaced the former with a 1,340-feet long and 12-feet high wooden construction. It did not take long for the street that ran along it to be named Wall Street, appropriately enough. [26]

The British indeed came in 1664, however not by land as Governor Stuyvesant had anticipated, but by sea. The Dutch surrendered, and the invasion ended peacefully. The terms of surrender were mild, and New Netherlands was able to continue doing business as usual. In particular, the British agreed that "all differences of contracts and bargains made before this day by any in this country, shall be determined according to the manner of the Dutch" [26, p. 11]. The *Articles of Capitulation* also stated that "any people may freely come from the Netherlands and plant in this country, and that Dutch vessels may freely come hither, and any of the Dutch may freely return home, or send any sort of merchandize home in vessels of their own country" [26, p. 11]. It was even the case that the elected Dutch officials were permitted to remain in office. Such agreement proved to be a highly intelligent move on the part of the British, suggests David Colbert, a noted historian, as it allowed them to benefit from "the strong currency, secure banks, reasonable interest rates, and fluid markets of the Netherlands, one of the most advanced economies in the world" [26, p. 11]. However, to honor the duke who financed their invasion, the British did require that the city be renamed New York immediately [26, p. 11].

As New York expanded, the wooden wall became useless and was torn down in 1698. Merchants moved to the Street in the early eighteenth century. Slaves, "those staples of seventeenth- and eighteenth-century commerce," were the main commodity of interest at this early time [51, p. 11]. Later, in 1752, New York's first formal market came into existence when a group of merchants organized a meeting place for dealings in slaves and corn meal. It was located at the foot of Broad Street and later in Fraunces Tavern, and held irregularly and infrequently [106, p. 15]. However, the colonial markets were not nearly as efficient as those of their mother countries, Britain and Holland, and many of the basic institutions were still lacking. Notably, the idea of an exchange "was slow in crossing the Atlantic" [46, p. 9].

4.5.2 Evolution of the New York Stock Exchange

Until the establishment of a strong federal government in the 1780s that followed the American Revolution, there were no full-time financial markets in North America. The reason is simple: there were few, if any, financial instruments to be traded. Then, in 1789, the Constitution came into effect, George Washington was inaugurated at the New York City Hall, and Alexander Hamilton was appointed the first Secretary of the Treasury. The last-named emerged as a most important figure of the country's financial scene. It was Hamilton who, in the words of John Steele Gordon, a noted market historian and author, argued that "one of the primary purposes in establishing a strong central government was to give people faith in the financial structure of the country and in the soundness of the currency and financial instruments of the government" [51, p. 11]. He managed to convince the Congress that the first natural step for the government in realizing this objective was refunding the debts it incurred during the Revolutionary War, and new federal bonds were issued for that purpose. The significance of these new issues is twofold: first, they constituted a body of "rock-solid" securities that could be traded, and second, they greatly diminished the cloud of uncertainty in which the country had been enveloped [51, p. 12]. And, as Gordon puts it, "it is uncertainty - far more than disaster - that unnerves and weakens markets" [51, p. 12]. Not less importantly, continues Gordon, Hamilton's efforts established "a vital precedent for the future of Wall Street: that the United States Government would stand behind its financial instruments and not repudiate them for political reasons" [51, p. 12]. This precedent played a critical role in facilitating the establishment and growth of the country's financial markets.

Soon after the first American securities - the new federal bonds (or "stock" as they were then called) and state bonds - came into existence, the trading in them began [77, p. 28]. Initially, the trade was handled by commodity brokers who would meet on Wall Street or in its proximity; later, these brokers began to specialize in trading securities. When the weather was nice, their favorite meeting place was the shade of an old buttonwood tree at 68 Wall Street; in bad weather, they sought refuge in nearby coffee-houses.[27] "And thus, for all its present marble magnificence, the New York securities market began very humbly indeed in the heat and rain and dust of a village street," writes Meeker in his book, *The Work of*

[27]Buttonwood trees are also known as sycamores. Also, please see [77] for more details.

the Stock Exchange [77, p. 29].

Early in May of 1792, a group of the more important of these early brokers decided to get better organized. So, on the 17th of May, they gathered at Corre's Hotel, and signed the agreement that among other things stated:

> We, the subscribers, brokers for the purchase and sale of public stocks, do hereby solemnly promise and pledge ourselves to each other that we will not buy or sell from this date, for any person whatsoever, any kind of public stock at a less rate than one-quarter of one per cent commission on the special value, and that we will give preference to each other in our negotiations. [106, pp. 20-21]

The Corre's Hotel Pact, in effect, established a guild of brokers. The first stock exchange agreement of any kind in this country, the Corre's Pact is taken to have "inaugurated" the New York stock market [77, p. 29].

Despite New York's efforts to improve its commercial effectiveness, it was Philadelphia that had supreme and more prestigious banks and that got most of the European business. Rivalry between the two cities was fierce indeed, with the Chestnut Streeters viewing the the Wall Streeters' actions "with suspicion and distrust" [106, p. 30]. The New York brokers, convinced that Philadelphia owned its financial supremacy to the fact that its were auctions better organized, decided to organize themselves on the model of Philadelphia. Twenty-eight prominent brokers formed the new Board of Brokers (later renamed New York Stock and Exchange Board), with the constitution that was almost an exact copy of the Philadelphia one [106, p. 30]. This first constitution dates back to March 8, 1817 [77, p. 30]. In 1863, the New York Stock and Exchange Board changed its name to the New York Stock Exchange.

Given the exclusivity of first the Board and then the Exchange, it is not surprising that much of the business took place outside, and not only among the nonmembers. The members themselves traded there after hours and in securities that were not listed on the Board. This outdoor exchange, also known as the curb market, was an "odd confabulation, whose roof was the sky, whose offices were in [brokers'] pockets, whose aspirations were boundless."[28] Some of these outdoor exchanges survived, others were absorbed by the Board, but most of them "just withered away when the financial climate, or even the weather, turned colder" [51, p. 14].

Then, in 1864, some of the curbers formed the Open Board of Brokers at 16-18 Broad Street. To organize their activities, they introduced rules for their innovative practices of admitting the public into the trading room and engaging in the continuous and the specialist types of trading. The curb and the Open Board became serious rivals to New York Stock Exchange. In fact, oftentimes the volume traded on the curb market would exceed greatly the volume traded on the floor of the New York Stock Exchange. On July 29, 1869, a mutually beneficial merger among the New York Stock Exchange, the Open Board, and the Government Bond Department took place.[29] As Wachtel points out, "this concentration and consolidation of securities trading in the NYSE paralleled the unification of capital in

[28]Medberry, *Men and Mysteries of Wall Street*, pp. 130-131; quoted in [110, p. 147].

[29]The Government Bond Department was a specialized government bond exchange.

the industrial economy through the trust" [110, p. 149]. Despite this consolidation, new curb markets continued springing up from time to time. As Howard Wachtel, an economics professor, explains, this was due to the conservative attitude of the New York Stock Exchange towards new companies, which consequently could be traded only on the curb [110, p. 149]. The last surviving outdoor exchange, which at the time was known as "the Curb" and now is called the American Stock Exchange, was established in the 1920s [51, p. 14].

Together with the above developments, a new class of people – the *nouveau riche* or the newly affluent - emerged, imbuing New York with a culture of "prosperity, social conformity, piety, hypocrisy, and a profound sense of progress in human endeavor," as Gordon eloquently describes [51, p. 47]. It was also the culture that unreservedly embraced the gospel of wealth and considered finding a fortune a "sign of God's grace" [51, pp. 47-48]. By the 1820s, New York had become what Gordon calls "the greatest boom town the world had ever known" [51, p. 28], or, as Oliver W. Holmes puts it, "the tip of the tongue that laps up the cream of the commerce of a continent."[30]

4.5.3 Robber barons and investment bankers

The early Wall Street was a breeding ground for predatory practices, such as the use newspapers to influence public opinion and facilitate cornering operations, 'forward trading,' or 'wash sales'[31] [46, pp. 32-33]. Natural selection and the survival of the fittest became deeply rooted in the market reality, as did personal ruin and bankruptcy. The New York exchange, as well as other regional exchanges, came to constitute personal battlefields of the robber barons, "that undeniably American class of capitalists" [46, p. 36]. Though the robber barons came from a variety of socioeconomic backgrounds, they had two things in common: the lack of formal education and the gift for exploiting structural deficiencies of the financial system. Cornelius Vanderbilt, Fisk, Gould, Drew, and Russell Sage, then John Rockefeller and Andrew Carnegie, are but a few prominent examples. They all amassed vast fortuned because of the structural deficiencies within the economy, and were indebted to their investment bankers, thanks to whom they were able to finance their ventures. [46]

The "promoter of the concept of Wall Street as trustee over the country's wealth," the investment banker "nudged aside the broker who had ruled the Street from its origins and became the most significant force on Wall Street in the last two decades of the [nineteenth] century," writes Wachtel [110, p. 136]. The investment banker was an underwriter; he purchased stocks and bonds from the companies, sold them in financial markets, and charged a considerable fee for his service. Investment bankers, such as J.P.Morgan, came to embody

[30]Oliver Wendell Holmes, Sr., writing in 1835; quoted in [106, p. 27].

[31]In 'forward trading,' traders would buy a stock at an arranged price, and deliver cash for the transaction in a month or two. They hoped that, in the meantime, the price would rise, so that, upon completing the deal, they could quickly sell at a higher price and make instant profit. Such contracts were quite common during the stock exchange's early years, despite the fact that they were not legally binding [46, p. 32]. In 'wash sales,' traders would conspire to buy and then immediately sell stock to each other at a price lower or higher than the existing price, thereby artificially simulating a bull or a bear market and establishing the desired prices for themselves [46, p. 33], [106, pp. 30-31].

the spirit of the Industrial Revolution. In their hands, short-term money from a number of investors was being converted into long-term industrial investments, so indispensable for carrying on of the industrial developments.[32]

The main agents in the creation of corporate America, robber barons and their bankers took advantage of cornering operations, seizing smaller companies and creating the larger ones, in order to dominate the marketplace [46, pp. 68-69]. The tendency to consolidate that they established became "a tidal wave that swamped American industry" in the last quarter of the nineteenth century [46, p. 98]. Not only did the fittest survive, but now "they were colluding to ensure that they remained successful," explains Charles Geisst, a market historian [46, p. 98].

4.5.4 Impact of technology

Like in Europe, in the U.S. technology contributed to the development of a national market. In 1866, the first permanent transatlantic telegraph cable was laid, establishing connection between London and Wall Street. Then, in 1867, a telegraph operator by the name of Edward A. Calahan invented the stock ticker, a printing device for stock prices that could be transmitted via telegraph. Before the invention of the stock ticker, messengers, also known as pad shovers, would literarily run from the exchange to the brokerage houses [110, p. 157]. A decade later, in 1878, the telephone, an invention of Alexander Graham Bell, was installed at the New York Stock Exchange. These three inventions - the telegraph, the stock ticker, and the telephone – "[pushed] the human brain's capacity to move information more quickly over space and to handle more of it," remarks Wachtel, thereby revolutionizing the way business was conducted on Wall Street [110, pp. 158-159].

4.5.5 The rise of technical analysis

At the turn of the nineteenth century "quite a cult of chartists mushroomed up who based their trading along technical lines" [107, p. 119]. The single most important figure in the rise of technical analysis on Wall Street was Charles H. Dow. After working as a newspaperman, a broker, and a floor trader on Wall Street, Dow became co-founder of the Dow, Jones and Company news service. On July 8, 1889, Dow, Jones, and Company first published the *Wall Street Journal*, with Dow as the editor. It was in his editorials that Dow proposed, at the turn of the nineteenth century, a highly influential theory of trends that later came to be known as the Dow Theory.[33] He is also celebrated for computing and publishing the Dow Jones industrial and railroad averages, which enabled traders to determine basic market trends. Such was his influence on the generations to come, that to this day he remains esteemed as the "father of technical analysis." What follows is an outline of some of Dow's most famous successors and their contributions to the field of technical analysis.

[32]For more details, please see [110].

[33]Dow himself never called his observations a theory. In fact, it was only after his death that the term Dow's Theory was coined, by S.A. Nelson.

Samuel Armstrong Nelson Nelson is best known as the author of *The ABC of Stock Speculation* (1903), a book in which he compiled and organized Dow's key editorials, and referred to them as the Dow Theory. In addition, Nelson had many ideas of his own, which he presented in his other two books, *The ABC of Wall Street* and *The Consolidated Stock Exchange of New York.*

William Peter Hamilton In 1899, Hamilton, a journalist by profession, joined the *Wall Street Journal*, and soon became one of Dow's great followers. Hamilton not only organized, but also expanded Dow's ideas. As Harold Gartley, another great technician, points out, "the Dow Theory as generally understood [is] almost entirely the joint work of Dow and Hamilton" [45, p. 174]. In 1922, Hamilton published a book called *The Stock Market Barometer*, in which he combined Dow's ideas with his own and put forth a method of predicting a stock market.

Robert Rhea Rhea was a Dow historian rather than an innovator. His greatest contribution lies in his systematization of the wealth of wisdom left by Dow and Hamilton. Rhea reduced the Dow Theory, as interpreted by Hamilton, to a set of axioms and theorems. It was Rhea's understanding that "the element of independent judgement or 'art' ... must accompany all Dow Theory interpretations" [45, p. 176]. He believed that Dow was successful not only because he possessed "the analytical power of a mathematician" and "the writing ability of a superior novelist," but also because he was blessed with "the intuitiveness of an artist" [97, p. 19]. Rhea is also famous for his article, *Stock Habits*, which appeared in the May 8, 1933 issue of *Barron's*. This article is the first discussion of the use of relative strength in stock market speculation [102, pp. 90-92]. He published three books: *Dow's Theory Applied to Business and Banking* (1938), *The Dow Theory* (1932), and *The Story of the Averages* (1932).

Richard Russell Russell is a recognized Dow theorist and historian. In 1960, he published *The Dow Theory Today*, a collection of twelve articles written between 1958 and 1960, in which he examined market developments by applying the Dow Theory to current and historical data. His market letter, *Dow Theory Letters*, which he began publishing in 1958, has a wide following.

Richard W. Schabacker Schabacker pioneered in the discovery of chart patterns in his highly influential books *Stock Market Theory and Practice* (1930), *Technical Analysis and Market Profits* (1932), and *Stock Market Profits* (1934).

John Magee and Robert D. Edwards Edwards and Magee used Schabacker's writings as a primary source in writing their *Technical Analysis of Stock Trends* (1948), a classic of the technical analysis literature, in which they not only systematized but also clarified and expanded Dow's and Schabacker's ideas.

Harold M. Gartley Gartley is credited for being the first to set down in writing the Wall Street's wisdom concerning trading volume and market breadth in his 1935 book, *Profits in the Stock Market.*

Ralph Nelson Elliott Using Rhea's writings on the Dow Theory and his own conviction that "the universe is ruled by law" where "all life and movement consists of vibrations" as his starting points, Elliott developed his wave principle of the stock market movement [96, pp. 53-59]. *Nature's Law - The Secret of the Universe*, published in 1946, is considered his final and definitive work on the principle.

William D. Gann Similar to Elliott, Gann believed in the "natural order existing for everything in the universe" [76, p. 3]. Convinced that "everything in existence [was] based on exact proportion and perfect relationship," he turned to the ancient sciences to discover how the stock market fit into nature's grand scheme[34] [58, p. 11]. Despite the esoteric nature of his theories, Gann is said to have had success rate on trades averaging to 80-90%, for which he became known as the "master trader" [76, pp. 2-3]. He wrote eight books, the best known of which are *Wall Street Selector* (1930), *45 Years in Wall Street* (1949), and *Truth of the Stock Tape* (1932).

John J. Murphy Murphy is a popular contemporary author on the subject. His *Intermarket Technical Analysis* (1991) pioneered a branch of technical analysis emphasizing interrelationships between various financial markets, while his *Technical Analysis of the Financial Markets*[35] (1999) is regarded as the standard reference in the field. *The Visual Investor* (1996), which applies charting principles to sector analysis, is his third book.

4.6 Highlights of Chinese Trade and Finance: From Ancient China to the Late Imperial Period

> *When the sun stood at midday, the Divine Husbandman held a market. He caused the people of the world to come together and assembled the riches of all under Heaven. These they exchanged with one another and then returned home, each thing having found its appropriate place.*[36]

4.6.1 Origins of Chinese Markets and Rise of a Merchant Class

Though the origins of Chinese markets can be traced back to the *Commentaries* of the *Book of Changes*,[37] very little is known about Chinese economy prior to the time of the Shang dynasty. As for the ancient Shang, we know that it was an agrarian civilization with towns.

[34]The above-mentioned ancient sciences include numerology, astronomical cycles, astrological interpretations, time cycles, Biblical symbology, and sacred geometry [111, p. 66]. In addition, Gann researched early Egyptian writings, and even traveled to India to gain access to the ancient pre-Hindu literature [58, p. 12].

[35]Rev. ed. of: *Technical Analysis of the Futures Markets.* c1986.

[36]Translation from R. Wilhelm, *The I Ching or Book of Changes*, translated into English by C.F. Baynes (New York: Bollingen/Pantheon, edition of 1961), Bk II, p. 129; as quoted in [114, p. 140].

[37]Please see the quote on the cover of this document. The *Book of Changes* originated thousands of years ago in ancient China, and it may be considered the oldest book in the world.

Agriculture was very labor intensive and otherwise at a primitive level. Artisans existed as dependents of the ruling class [81, p. 464]. It was at this time that a decentralized market pattern emerged. Namely, each village community had a local market town, a walking distance from the surrounding villages, where produce was exchanged by barter. Though vulnerable to natural disasters (floods, droughts), this traditional so-called market-center-and-village economy was rather robust – in favorable natural conditions it could maintain itself and survive despite of wars, invasions, and great social changes in the cities [37, pp. 12-13].

At the end of the twelfth century B.C. the Chou kings (also known as the Sons of Heaven) conquered the Shang people and established a feudal system. Economic life became centered around manors or fiefs governed[38] by the kings' friends and relatives. Peasants, who were serfs of their land-governing lords, provided goods and services for their own consumption and for that of their lords. Occupational specialization was minimal, with crafts being produced only for the royals in exchange for food. As Meskill points out, on the whole, "there was little commercial activity except for very small-scale barter trade" [81, p. 465].

This structure broke down during Ch'un-ch'iu and Chan-kuo times, "which represented a most important turning point in Chinese economic history" [81, p. 465]. The change was caused by technological advances in agriculture such as the adoption of iron implements and introduction of a fallow system, widespread use of a variety of fertilizers and plows with animals, and the expansion of irrigation facilities, to name a few. The resulting increase in agricultural productivity and output soon led to the following important developments: (1) the emergence of private ownership of land, (2) occupational specialization and the rise of industry, and (3) development of commercial activities and the rise of the merchant class [81, pp. 465-466]. By the time China became unified under Ch'in, four distinct economic sectors were in place: government, agriculture, industry, and trade. Similarly, one could distinguish between four different, though not independent, social classes: *shih* (officials), *nung* (farmers), *kung* (artisans), and *shang* (merchants) [81, p. 469].

It should be noted that before the foundation of the Ch'in empire in the third century B.C., commerce was important in China, but not so much as it was in other ancient civilizations. While records of partnerships, loans at interest, and deeds of sale and purchase are dated to the early second millennium B.C. in Babylonia, there was nothing like that in China before the Han dynasty [35, p. 164]. It was only around third century B.C. that trade began to flourish and a merchant class appeared in China. The power and influence of then young merchant class is illustrated in the following quote by Ch'ao Ts'o from the early second century B.C.:

> Well-to-do merchants accumulate goods and redouble their profits, while the less well-off sit in their shops and sell. They control the markets and daily enjoy their ease in the cities. They take advantage of the pressing needs of the government to sell at twice the normal price. Their sons do not plough or hoe. Their daughters do not raise silkworms or weave. They have fancy clothing and stuff themselves

[38]The Chou king, at least in theory, possessed all the land.

on millet and meat. They earn fortunes while suffering none of the hardships which the farmers suffer. Their wealth enables them to hobnob with princes and marquises, and to dispose of greater power than the officials. They wear themselves out in the search for profit ... and grow plump by means of hard dealing.[39]

4.6.2 Commercial Revolution

Between the eight and the thirteenth centuries (late T'ang and Sung) China's economy experienced unprecedented growth, establishing socio-economic patterns that remained largely unchanged until the nineteenth century. The causes of such a spectacular economic expansion include rapid population growth and a variety of technological improvements spanning the fields from agriculture to textiles and lacquer production, and porcelain making. Innovations especially relevant for merchants were the abacus, which came into use during late Sung and became a merchant's invaluable calculating companion for the centuries to come, and printing, which was initially used to produce important books[40] and later paper money [37, pp. 132-133].

But the most obvious reason for the Chinese medieval economic growth was the expansion of trade which promoted greater local specialization and led to increased production. Even the traditional Chinese contempt for trade[41] softened during this time. While during the early T'ang the government still tried to control and restrict commerce to designated government marketplace, by late T'ang that was no longer the case. The following Sung period gave birth to large commercial cities, those "great emporiums of trade," so different from the primarily administrative and political cities of the previous epochs [37, p. 134].

Moreover, while up until the early T'ang the interregional exchange of goods took place mainly through the government taxation,[42] during the late T'ang and Sung the private trader became more important than the government in this regard. Wholesalers or brokers would collect the local surplus of produce or manufacturies from peasants and artisans and sell them to transport merchants and shop owners [37, pp. 134-135].

The above-described commercialization of the peasant economy went hand in hand with the growth of the rural markets, also known as 'empty markets,' 'periodic markets,' 'mountain markets,' 'rural markets,' 'small markets,' 'morning markets,' 'early markets,' 'village markets,' and 'hay markets' [114, p. 142]. They were mostly small events held once every few days for a few hours early in the morning. Oftentimes, influential local people or merchants, who were the driving forces behind these markets, would be contracted by the government to collect taxes. In addition, in the largest markets an official controller's office would be set

[39] *Han-shu* (Han History), 24 *shang*; as quoted in [35, p. 164].

[40] A whole Buddhist sutra was printed in 868 and by the mid-tenth century all of the Classics were printed. During the Sung, large quantities of all kinds of books were produced. Only in the fifteenth century did this invention reach the West through Central Asia and the Middle East [37, p. 134].

[41] Please see [22, pp. 15-21] for more details about this traditional Chinese dislike of trade.

[42] Private traders dealt mainly in luxury items at this time.

up to collect customs and insure security. Rivalry between markets in nearby villages[43] was widespread, as each wanted to be special and suppress the other [35, pp. 169-170].

In addition to merchants, another group of people that came to prominence during this time are the brokers. From the very early times, at least since the time of the Chin Dynasty (265 - 419 A.D.), brokers were mediators between buyers and sellers of land, houses, livestock, and human beings (they often specialized in one of these commodities). Their job was to draw up a contract, report transactions to the authorities, collect a 'brokerage tax,' and charge 'broker's cash' as a commission [114, p. 165]. There were brokers for almost every commodity known to men "from curios and perfumes to charcoal and sites for burial" [114, p. 169]. How much brokers specialized depended on a particular market in which they operated. In smaller markets, brokers did other things in addition to brokerage; for example, a broker might double as a hostel owner, a retailer, a weights and measures expert, or a tax-payment agent for the rich [114, p. 169]. Brokers also frequently owned and operated lodges for merchants, inns-cum-stores, warehouses and storage facilities [114, p. 173]. The owners of storage facilities would buy up goods as they came into the market and engage in speculation, from which they made (and lost) most of their income [114, p. 176].

4.6.3 The Seventeen and Eighteenth Centuries: A Second Period of Sustained Economic Growth

The seventeen and eighteenth centuries saw a second period of sustained economic growth. During this time the number of market towns was increasing at a rate greater than that of the population increase. As the late Ming work entitled *A Record of the Customs of Wu* describes:

> The large villages and famous towns all developed shops which sold every kind of commodity, so as to monopolize the profits; and those who carried goods on their backs between towns and villages were all in distress.[44]

Market towns were formed around temples, manors of great landlords, houses of great merchants, pottery shops, customs houses, salt stores, and military stations. Not surprisingly, they were often found at the nodes in the transport system, such as intersections of waterways, resting spots along main water and land routes, and bridges. In addition to being founded intentionally by influential persons, markets were often set up by accident. For example, a bad harvest or plundering by rebels would force a particular region to engage in commerce with other regions. Naturally, such rapid economic development had a positive effect on the progress in human endeavor as it encouraged the flow of people, goods, money, and ideas. [35, pp. 268-269].

The markets in the county capitals supplied traveling merchants and peddlers, who then traveled to smaller rural markets. Whereas the markets in the administrative capitals were held daily, in countryside they were periodic events, held once or twice every ten days.

[43] Nearby here means less than four to eight miles apart.

[44] As quoted in [35, p. 268].

However, it should be noted that the most advanced rural regions already had permanent markets at this time [35, p. 270]. In any case, the extent of trade as truly astounding, as the following early seventeenth century passage conveys:

> Throughout the prefectures, the departments and the counties of Kiangnan there are waterways everywhere. Everywhere there are local specialties. Everywhere there is trading. At the present time there are controls on all this. At the river ports of every county and prefecture even such commonplace articles as rice, salt, chickens and pigs, and even such coarse ones as firewood, coals, vegetables and fruits are all affected. Every commodity is subject to a tax. Every person is subject to a tax. In no county is there one village at peace, and in no village is there one family at peace. People are being interfered with everywhere. Rich and poor alike are being molested.[45]

4.6.4 Similarities between the Late Imperial Chinese Merchant Culture and Present-Day Technical Analysis

One of the most prominent characteristics of Chinese commerce of the late imperial period (1550-1930) is the emergence of a well-defined merchant culture, founded on the belief that the market "was not a mysterious force beyond control," but one that could be "understood, mastered, and manipulated" [75, p. 137]. Merchants placed great faith in the "free operation" of the market and in the "inevitability of favorable market conditions"[75, p. 137]. At the same time, educational manuals for tradesmen flourished, providing instruction not only on technical matters, but also on character-training and personality cultivation based on Confucian values. Indeed, technical and social skills were deemed closely intertwined, and aspiring merchants had to train not only their mind but also their spirit to "achieve 'inner mental attentiveness,' subdue selfish desires, distinguish good from evil, and practice reciprocity" [75, p. 2, 51]. Benevolence, righteousness, propriety, moral knowledge, sincerity, caution, moderation, diligence, loyalty, courage, cultivating one's nature (*xing*), and nourishing one's vital spirit (*qi*) are all promoted in merchant education [75, p. 52]. In the following essay, we will consider some of the most widely used manuals,[46] and highlight the similarities between the late imperial Chinese merchant culture and present-day technical analysis.

An immediate aspect in which merchant manuals are reminiscent of technical analysis is their emphasis on the cyclicality of markets and the role it plays in accurate market timing. For example, *Essential Business* argues: "When goods become extremely expensive, then they must become inexpensive again. When they become extremely inexpensive, then they

[45]Sakuma Shigeo. *Mindai ni okeru shōzei to zaisei to no kenkyūi* (The Business Tax and Financial Administration in the Ming Period). *Shigaku zasshi* LXV.i and ii (1956): ii, 23. As quoted in [35, p. 269].

[46]Among these are *Shanggu bianlan* (*The Merchant's Guide*), compiled by Wu Zhongfu in 1792, which is a larger manual that includes both *Fianghu bidu* (*Essentials for Travelers*) and *Gongshang qieyao* (*Essentials for Tradesmen*); and *Xin'an yuanban shishang leiyao* (*Encyclopedia for Gentry and Merchants*) dating back to the late Ming [75, p. 10].

must become expensive again. This is the ultimate principle."[47] The same manual asserts that "no item will remain expensive for over one hundred days and no item will remain cheap for one hundred days," and that "when things reach an extreme, they will return the other way."[48] Similarly, *Encyclopedia for Gentry and Merchants* explains:

> Goods have their flourishing and waning and prices are not set. You must recognize that in the depressed market, upswings will also occur. When market prices are high, downturns are concealed. When prices begin to rise, anticipate a good time for selling (Mizuno Masaaki, *Shinan gemban shishō ruiyō ni tsuite* p. 104; as quoted in [75, p. 133]).

Yet another example is found in *The Golden Lotus*: "When the river is frozen, nobody buys rice. The price will go down again as soon as the ice melts."[49] As Lufrano suggests, this emphasis on market timing comes as no surprise if one remembers that ever since the ancient times the Chinese have been regarding the concept of timeliness as a most important one [75, p. 133]. In particular, the belief that the time is cyclical, where periods of order and economic growth alternate with periods of disorder and decline, can be traced back to as far back as the *Yijing* (*Book of Changes*).

Market information is another idea that is accorded a great deal of attention in both technical analysis literature and late imperial Chinese merchant manuals. *The Merchant's Guide* advises its readers to write letters so that they can know the "flow of goods everywhere" and thereby "know the information and opportunities in time and know what to do and what not to do."[50] Similarly, the author of the *Essential Business* urges tradesmen to leave their shops from time to time and visit other tradesmen in order to acquire current information regarding prices, demand, and supply of goods on the local market, and also to look for news regarding the situation in regions where the goods are produced. The manual then cautions readers that not all market changes are genuine and advises them to analyze the information at hand carefully. In particular, in order to determine whether the market change is genuine, one must weigh all the factors that caused the change. The degree of change is crucial as well: according to *Essential Business*, a large fall or rise in prices suggests that someone is manipulating the market and causing a false change.

Market manipulation is further discussed in *Encyclopedia for Gentry and Merchants*, where tradesmen are warned to beware of gossip-mongering when acquiring information [75, p. 134]. Yet more advice on the subject is provided in *Shishang yaolan*, which expaines: "Whatever is priced low can be bought and hoarded. If you want to do this, you must have a lot of money, as soon as prices rise, you can gain a profit that will not be small."[51]

Just like some of the current technical gurus teach their students that technical analysis is a tool for measuring supply and demand, late imperial Chinese merchants were given

[47]Wang Bingyuan, *Maoyi xuzhi yaoyan* (1900) p. 15; as quoted in [75, p. 133].
[48]Wang Bingyuan, *Maoyi xuzhi yaoyan* (1900) p. 15; as quoted in [75, p. 133].
[49]Egerton, trans., *The Golden Lotus*, vol. 3, p. 41; as quoted in [75, p. 133].
[50]Wu Zhongfu, *Shanggu bianlan*, vol. 2, p. 4; as quoted in [75, p. 136].
[51]Wang Qi, ed., *Shishang yaolan*, vol. 3, 3; as quoted in [75, p. 135].

detailed instructions on how to watch supply and demand and use the imbalances to their advantage. The following quote by Lufrano illustrates this point well:

> When buying and selling goods, the experienced tradesman must pay attention to supply and demand. When few customers come to his shop and goods begin to accumulate, he is advised in one essay to stop buying and to wait for the market to bottom out. When many customers demand a certain product and his stock begins to dwindle, he is advised to buy. However, if goods are too expensive, the author explains in another essay, then the tradesman must wait until prices go down again to purchase them. If he anticipates a rise in prices, the manual counsels in a later essay, then he must buy large quantities of wholesale goods while they are still cheap. The author also encourages the reader to store his goods rather than sell them when their price is at their lowest and no profit can be earned. In yet another essay, the reader is urged to be sensitive to even small price changes, for eventually small increases will lead to large accumulations of money [75, pp. 134-135].

Merchant manuals exhibit many other similarities with the current practice of technical analysis. Some emphasize proper execution of a trade: according to *Shishang yaolan*, in the face of constantly changing prices, tradesmen must remain patient and self-controlled, and at the same time make decisions quickly, before it becomes too late [75, p. 136]. Furthermore, an essay in *Essentials for Travelers* advises merchants to learn to predict changes in the price and availability of goods, though it does not develop the idea further [75, p. 136].

4.7 Comparative Study: Japanese vs. American Technical Analysis

During the seventeenth century, the Japanese castle town of Osaka grew into a great commercial center, and, due to its role as the national storehouse and a distributor of supplies, became known as the "kitchen of Japan" [86, p. 14]. By the late seventeenth century, the previously established informal rice exchange was institutionalized to become the Dojima Rice Exchange, located in downtown Osaka. The Exchange soon counted 1300 rice dealers. Up until 1710, trading was done in actual rice. The year 1710 saw the introduction of rice coupons, which, in effect, became "the first futures contracts ever traded" [86, p. 15]. It is at such early rice exchanges that the art of trading and speculation became more and more refined, eventually giving birth to Japanese technical analysis.

One of the greatest speculators of this time, and one of the fathers of Japanese technical analysis, was Munehisa Homma. Also known as the "god of the markets," Homma presented his ideas on technical analysis in his 1755 book entitled *San-en Kinsen Hiroku* (*The Fountain of Gold - The Three Monkey Record of Money*).[52] Parallels between Homma's wisdom and that of Charles Dow are striking. For example, Homma noticed that traders' emotions

[52] As Japanese technical analyst and author Hiroshi Okamoto points out, Japanese technicians of Homma's

significantly influenced the price of rice, and concluded that "the psychological aspect of the market was critical to [one's] trading success" [87, p. 14]. He hence began "studying the emotions of the market" which, he believed, "could help in predicting prices" [87, p. 14]. Similarly, as Russell points out, Dow's "observations concerning the emotions of the crowd and the movements of stocks form an intricate part of the Theory" [97, p. 17]. Moreover, Homma described the rotation of Yang, or bullishness, and Yin, or bearishness. As Nison, influential author on candle charting analysis, clarifies, "this [rotation] means that within each bull market, there is a bear market," and that "within each bear market, there is a bull market" [87, p. 15]. This is strikingly similar to the ideas Dow presented in his famous editorial *Swings within Swings*, almost a century and a half later. Homma also emphasized that "when all are bearish, there is cause for prices to rise," and that "when everyone is bearish, there is cause for the price to fall," which is practically equivalent to the contemporary theory of contrary opinion [87, p. 14]. He further advised that in order to "to learn about the market *ask the market* – only then can you become a detestable market demon," which sounds much like the *market discounts everything* principle of the Dow Theory [87, p. 16]. Finally, comments such as "volume has declined considerably" show that Homma paid attention not only to price, but also to volume, further revealing the level of sophistication of his technique [5, p. 13].

Given such remarkable similarities, it is important to consider "whether the analytical methods which developed separately in the U.S. and Japan turned out to be similar to each other because imaginative latitude is limited in this area, or whether the analytical method in one country developed first and then was disseminated to the other country," suggests Okamoto [5, p. 13]. Okamoto believes that the latter is true, Japan being the country of origin, and adds that the rice market in Osaka opened many years before the United States even won its independence in 1776 [5, p. 13]. Similarly, Nison finds it "amazing that before America was a nation, the Japanese were trading with contrarian opinion!" [87, p. 14]. Moreover, it has been argued that the Japanese version of technical analysis is not only older, but also more progressive that its American counterpart. For example, Nison suggests that the fact that "most of the West is still using bar charts," which are "one of the ancestors of the more evolved and productive candle charts," implies that "it is also using a less evolved form of charting than the Japanese are with candle charts"[53] [87, p. 18].

4.8 History of Financial Astrology

Financial astrology has its roots in the earliest civilizations. In ancient Mesopotamia, recording market values of various commodities was an "old and continuous" custom.[54] Within

time rarely publicly disclosed their knowledge, but preferred to keep it a family secret. Consequently, written material concerning the early Japanese technical analysis is extremely rare, *The Fountain of Gold* being among the most treasured pieces [5, p. 12-13].

[53] According to Nison, Japanese candle charts went through the following stages in their evolution: stopping charts, pole charts, bar charts, anchor charts, and, finally, candle charts [87, pp. 16-18].

[54] For example, Old Babylonian royal inscriptions listed "ideal" commodity prices, in order to give an impression of prosperity, while the Laws of Ešnunna and the Hittite Law Code both specified legal prices for

this custom a prominent place belongs to the Babylonian astronomical diaries, which were recorded on cuneiform clay tablets for almost four centuries in the city of Babylon, and which are believed to have originated between -747 and -734, during the reign of Nabonassar[55] [105, p. 5]. Among other things, the diaries regularly charted market quotations of barley, dates, mustard/cuscuta, cress/cardamom, sesame, and wool, often revealing even the smallest intraday fluctuations [105, p. 21]. Furthermore, Alice Slotsky, a historian of the ancient Near East, suggests that "the activities of the later diary writers were not limited to observation and record-keeping, but grew to encompass scientific forecasting" [105, p. 19]. In particular, the celestial omen corpus provides evidence of the attempts to forecast astrologically the cultivation, yield, and storage of various commodities, as well as the behavior of their market prices [105, pp. 25-29].

Another historical example of the application of financial astrology to commercial decision making is provided by *Memoria de tucte le mercantile* (1278), the oldest surviving Italian medieval commercial reference work.[56] In addition to being "a well rounded repertory of all things a merchant ought to know," this *Memoria* boasts a detailed astrological appendix [74, p. 38]. "Such a close connection of spices and stars does not occur in any other manual, and it certainly gives food for thought," writes Lopez, a great twentieth-century medievalist [74, p. 40]. While Lopez goes on to suggest that merchants made their purchasing decisions based on astrological forecasts, he concedes that it was not a common practice.

Though nowadays often denounced as mere witchcraft, financial astrology has become undeniably a market factor, as more and more market participants are turning to stars to guide their investment decisions [111, p. 20]. Financial astrologers believe that their craft is a tool for understanding market psychology. Henry Weingarten, a noted financial astrologer and author on the subject, describes it as "a mathematical psychology based on astronomy," capable of charting not only certain cosmic events, but also human emotions [111, p. 25]. As James Hyerczyk, an author on the subject of technical analysis, explains, "the planets' orbits, rulerships, groups of planets, and the sun and moon have an effect on the minds and actions of people," and therefore on the stock market [58, p. 19]. Financial astrologers hence study the natal horoscopes of markets and companies, as well as the positions of planets in the sky at any given time, and use them to chart and forecast the cycles and prices of stocks and commodities. However, they tend to use their craft in conjunction with conventional techniques, rather than in isolation. According to them, astrology is just one of the three "screens" or "layers" necessary for a successful investment strategy, the other two being fundamental analysis and technical analysis [111, p. 27].

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various commodities. Other sources of commodity prices include the *Chronicle of Market Prices*, as well as literary texts such as the *Coronation Prayer of Assurbanipal* and the *Curse of Agade* [105, pp. 8-9].

[55] Although the earliest available diary dates back to -651 [105, p. 5].

[56] *Memoria de tucte le mercantile* is believed to have been compiled by a Pisan merchant or notary in 1278 [74, p. 38].

Chapter 5

Technical Analysis from the Horse's Mouth: Interviews with Leading Practitioners of Technical Analysis

5.1 Introduction

In this chapter we turn to the interviews that we conducted with a highly heterogeneous mix of fourteen leading practitioners of technical analysis. In the light of the lack of standardization that is plaguing the current practice of technical analysis, we consider these interviews a necessary step towards gaining an understanding of the field. We summarize below some of the general lessons we take away from this project, and then present the individual interviews themselves.[1]

All the interview subjects impressed us as highly intelligent, rational, and open minded individuals, with a deep understanding of the markets. Even those who seemingly do rely on supernatural phenomena, such as astrology, are in reality skilled market analysts who use esoteric ideas as a marketing tool.[2] But highlighting the unconventional is certainly not the only way to have their voice heard – many successful technicians are well aware that much of the prejudice against them can be countered by careful communication of their ideas and avoidance of the technical jargon.

Most subjects agree that their practice of technical analysis is based on intuition *at least* 60-70 percent of the time. Though the Ned Davis group and Laszlo Birinyi argue that their decision making is for the most part automated with intuition playing only a minimal role, I would suggest that even their practice of the craft is largely intuitive at the modeling level. The intuitive judgment is present in deciding how exactly to design your models and which ingredients to use. In Murphy's words, "it's not so much a particular indicator, it's how you put it all together that matters," and the most successful at this synthesis are those

[1] All of our subjects gave us written permission to publish their interviews as part of this thesis. The release forms are kept at the MIT Lab for Financial Engineering.

[2] This was pointed out to us by many of our subjects.

who through experience have gained deep understanding and perceptive insight of how the economy and the markets function.

Moreover, how to integrate all the pieces of information cannot be taught. As John Murphy puts it, "I am not sure I could explain to you how I do what I do – I look at many things in a short interval of time and come to a conclusion." It is for this reason that the subjects do not have a problem with sharing their knowledge, the tools they develop, or the strategies they pioneer.

In other words, there is no single right way to put it all together – everyone does it in slightly and sometimes widely different ways. While some technicians operate best in complete isolation from the outside world – Linda Raschke who does not watch TV or read the Wall Steet Journal being the prime example – others prefer to complement their technical perspectives with the fundamental, economic, and political ones. With this observation in mind, the at first striking heterogeneity among the technicians becomes understandable.

It is precisely because of this heterogeneity of technical styles that opinions on certain issues differ widely among the technicians. For example, the answer to the question "does the lack of hard and fast rule in technical analysis ever bother you?" varied from "that's exactly what bothers me" to "but there *are* hard and fast rules in technical analysis." In this particular case the answer depended on how the subjects read the question. While certain rules indeed can be taught, synthesis of the rules and interpretation of the results are based on practitioners' own experiences and perceptions, and hence are not hard and fast.

Consequently, if technical analysis continues to be practiced the way it is practiced today, it will be a long time before artificial intelligence becomes sophisticated enough to replace a human technical analyst. "This is still a human game," says Farrell.

As Shaw points out, good practitioners are asking the right questions while not necessarily providing answers. How do they know what the right questions are? They look at history. Perceptive technicians who have lived through or at least studied previous bull and bear markets are able to discern connections between the current and the precedent. Since history tends to repeat itself, this enables them to focus their thinking in the right direction.

There are many different career tracks within technical analysis, and the key to success lies in chosing the one that suits your personality. The differences in personality types of successful traders (Raschke, Weinstein), educators (Murhpy, Acampora), long-term investors (Desmond, Deemer), artist technicians (McAvity), highly automated practitioners (Ned Davis group), highly eclectic technicinas (Dudack), historians (Shaw, Acampora), long-term market theme writers (Farrell), and those who insist on being labeled market rather than technical analysts (Farrell, Birinyi) was apparent to me when I met them in person or even just talked to them over the phone.

That the subjects are bothered by the fact that their craft is not recognized by the institutional and academic establishments is clear either from their actions or from the tenacity and emotion with which they argue that the lack of acceptance does not bother them at all. Murphy's and Desmond's candid admission of their disappointment over the widely perceived inferiority of technical analysis to other forms of financial analysis, Acampora's efforts to gain wider acknowledgment for the MTA administered exams, Farrell's and Birinyi's

refusal to be labeled as technicians, and Birinyi's publication of the pamphlet entitled *The Failure of Technical Analysis* are but a few telltale signs of their displeasure with the aura of skepticism that is attached to their work. Finally, the very fact that these successful practitioners happily donated three hours of their time to our research project speaks for itself.

Contrary to the tendency to deny their displeasure at the widespread suspicion with which their craft is viewed, the subjects openly voiced their concern with what they see as the academic world's "reinvention," via behavioral finance, of technical analysis. There are many instances in which academic definitions and technical practices closely mimic each other. For example, the *representative heuristic*, which Shiller (1998) describes as a "tendency to categorize events as typical or representative of a well-known class," echoes the technicians' emphasis on drawing on the historical phenomena to understand the current ones.[3] However, while critical of the work that tries to "reinvent the wheel," technical analysts are supportive of the research efforts that take active interest in what they do and which they hope will earn them the respect they consider long overdue.

[3]Indeed, each and every participant emphasized the importance of studying the history of the markets. Laszlo Birinyi even goes to the extent of collecting and analyzing major newspaper articles that appeared over the last seventy years.

5.2 Participant Biographies

5.2.1 Ralph J. Acampora

Ralph J. Acampora, Managing Director, has served as Prudential Equity Group, LLC Director of Technical Research since July 1990. From 1980-1990, Mr. Acampora was Director of Technical Research at Kidder Peabody & Co. He is a widely recognized industry leader in the field of Technical Market Analysis who authored his first book entitled *The Fourth Mega Market: Now Through 2011.*

Mr. Acampora is well known for having been one of the few technical analysts on Wall Street to foresee that the Dow Jones Industrial Average, perhaps the most widely accepted barometer of the stock market in general, would achieve record gains. He has been a regular panelist on Louis Rukeyser's Wall Street and is regularly consulted for his opinion about the market by major national newspapers throughout the country including The Wall Street Journal, Barron's, Business Week, USA Today, and hundreds of local papers. Mr. Acampora has appeared on the Today Show, NBC Nightly News, CNBC, CNN, CNN-FN and other business news stations.

With more than 35 years of technical experience, Mr. Acampora has been instrumental in the development of modern-day technical analysis. He co-founded the Market Technicians' Association in 1970, and is a past president of that group; founded and was the first chairman of the International Federation of Technical Analysts, comprising 4,000 colleagues around the world; and helped create the Chartered Market Technician (CMT) examination that now leads to the technicians' version of the CFA.

Additionally, Mr. Acampora has dedicated time in his life to improving education in the inner city by returning to his own educational roots in the South Bronx, New York. He sits on the Board of Trustees of All Hallows High School, where he has served as a teacher and mentor. His dedication was acknowledged by Teachers College, Columbia University in April 1997, when he became a member of their "Honor Roll of Business Volunteers for Education."

5.2.2 Laszlo Birinyi, Jr.

Laszlo Birinyi, Jr. is the President of Birinyi Associates Inc. He began his career as a sales trader and joined Salomon Brothers in 1976. While at Salomon Brother, he conceived the money flow analysis, created the Salomon-Russell International Index, and authored *The Equity Desk*, a book originally intended for Salomon Brothers' training course. In addition, he wrote the firm's first weekly market commentary, *Stock Week*, and topical studies on volatility, flow of funds, market structure, and transaction costs. In 1989, while a Director at Salomon Brothers, Mr. Birinyi left to form Birinyi Associates, a money management and research firm. Mr. Birinyi is also an occasional contributor to Forbes and Bloomberg Personal Finance, and was a panelist on Wall $treet Week with Louis Rukeyser from 1990 to 2003. He has been on the year-end show in six of the ten years from 1992, and was inducted into the W$W Hall of Fame in 1999.

5.2.3 The Ned Davis Group

Ned Davis

Ned Davis is Chief Executive Officer and Chief Investment Strategist of Ned Davis Research, Inc. (NDR), an independent institutional investment research and advisory firm which he founded in 1980. He authors, three times per week, *Institutional Hotline*, the firm's most popular publication, and contributes to NDR's *Chart of the Day* publication. Before 1980, Mr. Davis was a Partner and Director of Technical Research at J.C. Bradford & Co. for 12 years.

Mr. Davis is a Phi Beta Kappa graduate of the University of North Carolina at Chapel Hill, and has attended the Harvard Graduate School of Business. He is also known for his two books, *Being Right or Making Money* and *The Triumph of Contrarian Investing*, published in 1991 and 2003, respectively.

Timothy Hayes

Timothy Hayes joined NDR in 1986. He is currently the firm's Global Equity Strategist. In his role, he oversees the firm's global and U.S. equity allocation services, authors two of the firm's weekly publications, *Stock Market Focus* and *International Focus*, and contributes to the firm's monthly *Investment Strategy* publication.

Mr. Hayes is a frequent guest on major financial television programs such as CNBC, CNN, and Bloomberg television, and has been quoted in leading financial newspapers and magazines, including *Barron's*, *The Wall Street Journal*, *Investor's Business Daily*, *New York Times*, and *TheStreet.com*. He has published his research articles in the *MTA Journal* and *Technical Analysis of Stocks and Commodities* magazine, and is known as the author of the book entitled *The Research-Driven Investor*, published in 2000.

Mr. Hayes was the recipient of the Charles H. Dow Award in 1996, sponsored by Dow Jones & Co. and Barron's.

Robert Schuster

Robert Schuster joined NDR in 1989 as an analyst for the Bond/Economic service, and became the Director of Custom Research in 1995. In his role, he supervises the development of customized products for NDR's institutional clients, and coordinates research projects for NDR as a whole. In addition, Mr. Schuster contributes to NDR's *Chart of the Day* publication, and is an active member of NDR's senior management.

Mr. Schuster graduated with honors from the University of Illinois with a Bachelor of Science in Finance. His paper, *S&P Group Lead Time Analysis*, was published in the *Market Technicians Association Journal*.

5.2.4 Walter Deemer

Walter Deemer began his Wall Street career in July of 1963 at Merrill Lynch, where, after nine months of research training, he worked as a full-time market analyst directly under Bob Farrell. In February of 1966 Mr. Deemer joined Tsai Management and Research just before the initial offering of the Manhattan Fund. Then, in May of 1970, he went to the Putnam Management Company in Boston, where he headed Putnam's Market Analysis Department throughout the ten years he worked there. For part of that time, Mr. Deemer served as a full member of Putnam's Investment Policy Committee, and he was promoted to Senior Vice President in 1976. Mr. Deemer formed his own company, DTR Inc., in July of 1980, and has been offering his market strategies and insights to institutional clients on a consulting basis successfully ever since.

Mr. Deemer is a founding member and past president of the Market Technicians Association. He has twice addressed the Conference on Technical Analysis, held in Cambridge, England, and has also addressed the Boston Security Analysts Society, the San Francisco Society of Security Analysts, and the Contrary Opinion Forum. He has appeared on the *Nightly Business Report* and has been the special guest on *Wall Street Week.* Mr. Deemer is the featured technical analyst in Dean LeBaron's *Treasury Of Investment Wisdom*, joining such luminaries as John Bogle, Peter Lynch, and George Soros as the chosen "guru" in their field.

5.2.5 Paul F. Desmond

Paul Desmond is the President of Lowry's Reports, Inc., the oldest technical investment advisory firm in the Nation. Lowry's is particularly unique in the advisory field in that its analysis, which is based solely on the Law of Supply versus Demand, has been conducted in exactly the same manner for the past 70 years. About 85 percent of the Lowry subscribers are professional investors, and almost 20 percent of them have subscribed for 25 years or more. Mr. Desmond joined Lowry in 1964 as Director of Research and advanced to the presidency in 1972.

Mr. Desmond is a Past President of the Market Technicians Association and was the recipient of the Charles H. Dow Award in 2002, sponsored by Dow Jones & Co. and Barron's.

5.2.6 Gail M. Dudack

Gail Dudack is chief investment strategist and managing director of research with SunGard Institutional Brokerage Inc. Prior to SunGard, Ms. Dudack was chief investment strategist for UBS, chief market analyst at the Pershing division of Donaldson, Lufkin & Jenrette, as well as president of DLJ's federal credit union. In the past, Ms. Dudack served as a president of the Market Technicians Association and as a member of the New York Society of Security Analysts' board of directors. She is currently Chair of the SIA's Securities Industry Institute.

Ms. Dudack has been quoted in leading financial newspapers and magazines, including the *Barron's*, the *Financial Times*, the *New York Times*, *USA Today*, and *The Wall Street*

Journal. She has appeared on the popular "Wall Street Week" television show as a regular panelist, often in the company of fiscal prognosticators such as Allan Greenspan and Sir John Templeton.

Ms. Dudack is the recipient in 1997 of the Market Technicians Association's "Best of the Best Award" for price analysis and market forecasting for the previous five-year period. She holds an honors degree in economics from Skidmore College.

5.2.7 Robert J. Farrell

Robert J. Farrell was at Merrill Lynch for half a century before he retired in 2004. He was Chief Market Analyst until 1992 when he assumed a new role as senior investment advisor. He published the first report on Wall Street on longer-term theme and sector changes in the market. He ranked first 16 times in the market timing category of Institutional Investor magazine's All-America Research Team, and in 1993, was inducted into the Wall $treet Week Hall of Fame. Furthermore, he is a founder and first president of the Market Technician's Association.

Mr. Farrell holds a bachelor's degree in economics and finance from Manhattan College and a master's degree in investment finance from the Columbia University Graduate School of Business.

5.2.8 Ian McAvity

Ian McAvity started his professional career in 1961 as a banker at the Bank of Montreal. In 1965 he went to Wall Street to work in the research department of Dominick and Dominick, then a major brokerage firm, and remained in the brokerage business for the following ten years. Since 1972 Mr. McAvity has been Publisher and Editor of *Deliberations on World Markets*, a technical analysis based newsletter that is mostly charts with commentary. *Deliberations* provides insights on the major world equity, bond, Forex, and precious metals markets, and is renowned for its timely and unusual graphic presentations.

Mr. McAvity is one of the founding directors in 1983 of Central Fund of Canada, an AMEX listed bullion fund, and Central Gold-Trust (listed on TSX.) He was written up in leading financial newspapers and magazines, including *Barron's* and *The Wall Street Journal*, and was a guest on *Wall Street Week* several times in the 1970's and 1980's, and then opted for a lower public profile in the 1990's. He has been a featured speaker at investment conferences and technical analyst societies in Canada, the USA, Britain, France, Germany, Switzerland, Holland, Denmark, and South Africa.

During the 1960's Mr. McAvity was a world-class squash player. His doubles team won the Canadian National Doubles Championship in 1969, and was finalist in the US National Championships. He was ranked in the top five in singles, and number one in doubles, in Canada in the late 1960's. He retired from squash in the early 1970's after taking Pakistani born professional Sharif Khan, by then a Canadian citizen, to South Africa to break apartheid in squash in 1972. That trip enabled South Africa to host the world championships the next year. When the Canadian government intervened to block the participation of a Canadian

team, he retired from the game to protest the Canadian Squash Association selling out to such political pressure.

5.2.9 John J. Murphy

John J. Murphy is a Chief Technical Analyst of Stockcharts.com – a provider of online analysis for investors – and a President of MurphyMorris Money Management Company. Previously, he was a Director of Technical Research at Merrill Lynch.

Mr. Murphy is a popular author on the subject. His *Technical Analysis of the Financial Markets* is regarded as the standard reference in the field, while his *Intermarket Technical Analysis* pioneered a branch of technical analysis emphasizing interrelationships between various financial markets. *The Visual Investor*, which applies charting principles to sector analysis, is his third book. Mr. Murphy, a former technical analyst for CNBC, has appeared on major financial television programs such as Bloomberg TV, CNN Moneyline, Nightly Business Report, and Wall Street Week with Louis Rukeyser, and has been quoted in leading financial newspapers and magazines, including the Barron's.

Mr. Murphy is a recipient in 1992 of the first award for outstanding contribution to global technical analysis given by the International Federation of Technical Analysts. In 2002 he received Market Technicians Association Annual Award. He holds a BA in Economics and an MBA from Fordham University.

5.2.10 Robert R. Prechter, Jr.

Robert R. Prechter, Jr., CMT, began his professional career as a Technical Market Specialist with the Merrill Lynch Market Analysis Department in New York. He has been publishing *The Elliott Wave Theorist*, a monthly forecasting publication, since 1979. Currently he is president of Elliott Wave International, a market analysis firm which serves institutional clients in analysis of global stock, bond, interest rate and currency markets, as well as metals and energy markets. He is also Executive Director of the Socionomic Institute, a research and consulting group.

Mr. Prechter has authored 13 books, including *Elliott Wave Principle – Key to Market Behavior* (1978), *R.N. Elliott's Masterworks* (1980), *The Wave Principle of Human Social Behavior and the New Science of Socionomics* (1999), *Conquer the Crash* (2002), and *Pioneering Studies in Socionomics* (2003).

During the 1980s, Mr. Prechter won numerous awards for market timing, including the United States Trading Championship, and was awarded the "Guru of the Decade" title by Financial News Network (now CNBC). He has been named "one of the premier timers in stock market history" by *Timer Digest*, "the champion market forecaster" by *Fortune* magazine, "the world leader in Elliott Wave interpretation" by the Securities Institute, and "the nation's foremost proponent of the Elliott wave method of forecasting" by *The New York Times*.

Mr. Prechter graduated from Yale University in 1971 with a degree in psychology. He served as the 21st president of the Market Technicians Association, and is a member of

Mensa, Intertel, the Shakespeare Fellowship and the Shakespeare Oxford Society.

5.2.11 Linda Bradford Raschke

Linda Bradford Raschke began her professional career in 1981 as a market maker in equity options on the floor of the Pacific Coast Stock Exchange, and has also worked on the floor of the Philadelphia Stock Exchange. After seven years on the floor, she left the exchange to expand her trading in the futures markets. In 1993 she became a Commodity Trading Advisor, managing money and running commercial hedging programs in the metals markets. She is currently the President of LBRGroup, Inc., a money management firm and registered CTA where she continues to manage money and trade her proprietary accounts, while posting her trading activity real time online.

In the early 90's Ms. Raschke formed a research partnership with Moore Research Center and pioneered work on volatility based trading indicators. She has presented her research and lectured on trading at conferences for the Market Technician's Association, International Federation of Technical Analysis, Canadian Society of Technical Analysts, TAG, Omega World, Managed Futures Association, International Online Trading Expo, AIQ, Futures Magazine, Bloomberg, Money-Expo.com, Carlin Equities and has lectured in over 16 different countries for Dow Jones/Telerate. In 1996, she published a book entitled *Street Smarts – High Probability Short-Term Trading Strategies*, which she coauthored with Laurence Connors.

Ms. Raschke was recognized in Jack Schwager's critically acclaimed book, *The New Market Wizards.* She has been featured in dozens of financial publications, radio and financial television programs, and has served on the Board of Directors for the Market Technician's Association for many years.

Ms. Raschke received a degree in Economics and Music Composition from Occidental College in 1980.

5.2.12 Alan R. Shaw

Alan Shaw started his Wall Street career as a junior fundamental securities analyst with Harris Upham and Company in 1958. Having become actively involved in technical analysis in the early 1960's, he created the technical analysis research department at Harris Upham, prior to its merger with Smith Barney in 1976. At Salomon Smith Barney, Mr. Shaw served as a senior vice president and managing director, a member of the Policy Coordinating and Stock Steering Committees, and the manager of technical research, until he retired in 2004.

In 1960, Mr. Shaw was a founder and the first president of the New York Society of Junior Security Analysts, and was a founder and the second president of the Market Technicians Association (MTA). He had been named on the Institutional Investors All-America Research Team for Technical Analysis for over twenty years, and was ranked number one from 1993 to 1999. In 1997, he received the Market Technicians Association Lifetime Achievement Award.

A dedicated educator, Mr. Shaw taught technical analysis at the New York Institute of Finance from 1996 up to his retirement. Additionally, he lectured at Wharton's annual Securities Industry Association seminars throughout his career.

Mr. Shaw holds an honorary Doctor of Laws degree from Susquehanna University.

5.2.13 Anthony Tabell

Anthony Tabell started his professional career in 1954, when he joined his late father Edmund W. Tabell at Walston and Co., doing technical research and consulting with institutions. He was appointed assistant vice president, vice president and senior vice president successively. He served on the board of directors, and later became the director of technical research.

In August, 1970 Mr. Tabell left Walston to form Delafield, Harvey, Tabell in Princeton, NJ, where he continued to consult with institutions, and provided research input to investment advisory operation. When Delafield, Harvey, Tabell merged with United States Trust Company in 1992, he became senior vice president of US Trust Company of New Jersey.

Mr. Tabell began applying computers to technical research in the late 1950's, and is known to have headed one of the first computer installations devoted solely to technical analysis.

Mr. Tabell was a founding member of the Market Technicians Association. He served as president of the MTA in 1975-1976, and remained a member of its Board of Directors until his retirement in 1993.

5.2.14 Stan Weinstein

Stan Weinstein is president and founder, in 1990, of Global Trend Alert, an advisory service that provides both intermediate and longer-term outlooks for global markets and equities to institutional investors. He is also known as publisher and editor of *The Professional Tape Reader* market letter, which he retired in January of 2000, as well as the author of *Secrets for Profiting in Bull and Bear Market*, which he published in 1988. Mr. Weinstein was a frequent guest on major financial television programs, was one of Louis Rukeyser's Wall Street Week elves, and has been quoted in leading financial newspapers and magazines, including *Barron's*, *The Wall Street Journal*, *Investor's Daily*, *USA Today*, *New York Times*, *Business Week*, and *U.S. News & World Reports*.

5.3 An Interview with Ralph J. Acampora

5.3.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

RA: I first came to Wall Street in 1966. My educational background is history and political science, and I worked on the master's degree in theology, so I had absolutely no background in this business. When I came into the Street, I came after a couple of years in a Catholic seminary. I had a major spinal fusion operation – that's what stopped my theology studies. My father's very best friend was a man by the name of William Downe, who at the time was a specialist on the floor of the New York Stock Exchange with a firm called Spear, Leads and Kellogg. Bill Downe was able to get me this very fine back surgeon. Every day Mr. Downe would come to the hospital and visit with me. Every day that he visited, he had Wall Street Journal, Forbes Magazine, Barron's, all those publications. I was in a body cast for three months, so I was like a little inverted turtle. Everything that Downe was reading, he would throw on the bed. I was like a little captive, so for three months, I was reading all this stuff about Wall Street. That was my first exposure to the Street. Then, when they took the cast of and I said to him I was not going back into the seminary, he asked: 'What do you want to do with your life, young man?' I told him I enjoyed reading the stuff he had given me. He laughed and said: 'You like reading it?' I said: 'Yes, it's fascinating.' He said: 'That's research.' You have to understand, that was in the mid-60's, and research, as we know it today, was in its very formative stages in those days.

Mr. Downe knew absolutely everybody, and he introduced me to Bill Grant at Smith Barney. And Smith Barney was probably one of the first brokerage firms to create what we know today as modern fundamental research. So I was introduced to him; he spent some time with me and said: 'Young man, go home, get your MBA, come back, and we'll give you a job.' But I had many, many years of schooling – I was now 27 years old – so I said: 'No, I don't want to go back to school.' And Mr. Downe was frustrated he couldn't help me, because I didn't have the fundamental background for research. I was still on crutches, and I literarily hobbled around Wall Street. I went from job interview to job interview. After a while I became interview smart, and realized that I wanted to be an analyst.

At one of the interviews I met these people at a firm called Distributors Group, which was a small mutual fund, and they hired me. My working day was split in half. The first half of my day was devoted to maintaining a point and figure chart library of over 2000 charts that I did by hand. The second half of the day was devoted to calculating price earnings ratios for companies that our firm had an interest in. I was spending half of my life doing technical analysis and the other half doing fundamental analysis. These people were so kind and wonderful that they kept pushing me, and I apparently excelled at it.

The man who started this mutual fund was Harold X. Schreder. Mr. Schreder was an economic advisor to President Eisenhower at one point in his life. One day I asked Mr. Schreder: 'Sir, why am I spending half of my day plotting little X's on a piece of paper?'

I'll never forget what he said – it was the most wonderful explanation of what I was doing in technical analysis. He said: 'Did you ever feed chickens?' I said: 'I beg your pardon? I am from the Bronx, we don't know about raising chickens.' And he said: 'Well, I was born on a farm. If you take chicken feed in your right hand and you throw it over your left shoulder, chickens run to your left. If you take chicken feed in your left hand and throw it over your right shoulder, the chickens run to your right.' I was saying to myself: 'Where is he going with this analogy?' And then he said: 'After you do that stop, and look down on the ground, and what do you see?' I didn't know what he was talking about. He said: 'You see little chicken scratches that look like little X's. By making those little X's, you know where the birds are going, you know where the investors are going.' I think that's the most profound thing I've ever heard in my life about technical analysis and point and figure – knowing where "they" are going.

Mr. Schreder ran a very successful business, and he insisted that every portfolio manager had to plot the stocks they owned in their respective portfolios. Every Thursday we would meet, and portfolio managers would stand with charts of the stocks that they owned in their portfolios – if anything started looking suspicious on a chart, people would whistle, make noises, and say: 'Hey, how can you own that ugly thing?' That was discipline. That was my first introduction to technical analysis. It was in late 60's. By 1968 they sent me to the New York Institute of Finance, in order that one day I might become a portfolio manager.

The New York Institute of Finance is a school of Wall Street, and I took a series of classes. One of the classes was taught by a gentleman by the name of Alan Shaw. He was my professor. Alan had asked the class if anyone could do a point and figure chart. I raised my hand, and I said: 'I can give you all sorts of versions of point and figure charts,' and I kept going all around the board. He said: 'Stop! I think I get the hint, you can do this.' And I kept going and going. He mumbled something like: 'Gosh, I could use a good man.' I ran after him and I bugged him until he hired me. Alan became my mentor and dear friend. We started working worked together starting in October of 1969, I can't begin to tell you how much Alan taught me.

Around 1970, Alan Shaw was to have lunch with a man by the name of John Greeley. John Greeley was also running a technical department, and he had a young fellow with him by the name of John Brooks. Alan couldn't make the lunch, so he sent me. It was at that luncheon that John Brooks and I asked each other: 'Who do you know in technical analysis?' I told him about Alan Shaw, and he knew a fellow by the name of Bob Farrell at Merrill Lynch. I said: 'Wow, those are important names.' That was the beginning of the Market Technicians' Association. It was actually John Brooks and I, with a little help from Greeley, who started it. We did it because the only place where Wall Street analysts met corporate America was at the New York Society of Security Analysts in those days. Getting a ticket to go to a luncheon to listen to the chairman of General Motors was virtually impossible for junior analysts like ourselves. We noted that all of the fundamental analysts had their own little groups – the chemical analysts met, the drug analysts met, and the oil analysts met – to share their ideas. Technicians never did that, because we never had a formal group, and that's what John Brooks and I wanted to do. We wanted to unite the technicians of Wall

Street, so that we could sit down and talk with each other. Of course, we went back to our old mentor friends – John Brooks went to John Greeley and got his help, I went to Alan Shaw and got his advice. We were able to get help from Bob Farrell, as well.

Furthermore, while working at Harris Upham with Alan, I met a very famous man by the name of Ralph Rotnem, who was Alan's mentor. (By the way, Smith Barney bought Harris Upham, so I eventually got to work for Smith Barney after all.) In your quest to know about the history of technical analysis you'll find out about Edson Gould, Ralph Rotnem, Ken Warden, Edmond Tabell, Tony Tabell, John Schultz – these are all great names.

The mission and the goal of the MTA was and is today to educate ourselves and to educate the public about the true meaning of technical analysis. People think that the MTA started in 1973. It officially started in 1970, but it was incorporated in 1973. Our first president was Robert Farrell at Merrill Lynch. Alan Shaw was our second president. These people were very well known in their circles. I eventually started teaching technical analysis at the New York Institute of Finance where I've been teaching it for over three decades. I love teaching. The New York Institute of Finance kept the flame of technical analysis. That's where it was taught formally.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

RA: That's a good question, because most of us are self-taught. Again, the New York Institute of Finance was so specialized, and in those days not everybody went there, but the few of us who did, were lucky enough to have technical analysis classes. Was I self-taught? Yes, but with the fortunate opportunity to attend the school, so, I was both self-taught and formally educated.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your analysis?

RA: Many years. If I count the years with Distributors Group, it would be 3 years of plotting charts, and I started writing formally after a couple of years of being with Alan. So I'd say it was about 5 years of study before I actually started applying what I knew.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

RA: There were many indicators that Alan Shaw built and that we built together, that we didn't find in books. That was part of doing research in those days. A lot of it was constructing your own studies and your own approach to things. But before we could do that, we all had to learn the basics, which were the old classic books in technical analysis, like the Edwards and Magee book or the classic works of Alexander Wheelen on the point and figure method. You had to start with basics, and the basics were written in the old books.

J: Which mistake did you learn the most from?

RA: I don't know if it was a mistake necessarily, but it was trying to make more of technical analysis than it is. The biggest mistake people make is to overburden themselves with indicators and things. When you interview the older technicians, they are going to tell you, the simpler you keep it, the better it is. In my early days, I was trying to do too many things with the subject, which was fine – we didn't have that many indicators anyway. Now, with the advent of a computer, they are back-testing everything and trying to reinvent the wheel, and I don't think you have to do all that. Keep it simple. A few months ago I interviewed Richard Russell, who is the living guru of Charles Dow. I asked him: 'Dick, what few words could you leave to the younger generation of technicians?' He said: 'Always follow the major trend.' If you understand the major trend in the market, then everything will fall in place. I agree with that. So the mistake – and I don't even think of it as a mistake, it was a learning curve – was trying to do too much.

5.3.2 Personal style

J: Could you describe your own distinct style of technical analysis?

RA: I've been in the business for almost 40 years. I think the biggest thing I bring to the table – and that's probably my style – is history. I was a history major in college, and I love history. A few reports that I might have been successful in writing basically reconstructed historic events, and applied them to the current market. It worked. That's what technical analysis is – it's really history.

J: How much of what you learn from others do you directly apply in your own analysis?

RA: All of it. What I learned in the past from Alan and other people whom I met, I've adopted. I don't think I've changed all that much.

J: How do you learn what works for you and what does not, without making big loses?

RA: If I come up with a new idea, indicator, or philosophy, I'll first try it out off to the side, and I won't incorporate it into my thinking until I am sure that I feel comfortable with it. So I may work with something for a couple of years, before I spring it out on some unsuspecting investor. I am very careful with what I use.

J: In what kind of market conditions do you make most mistakes?

RA: When you are in a trending market, I believe things are easier. When you are in a non-trending market, which is by definition much more volatile, the odds of making mistakes

increase. For example, I tell my students that moving averages are very helpful in trending markets – they keep you in a direct path. However, don't ever use moving averages in trendless markets, or at least be very careful when using them in there, because you'll get whipsawed. So a trendless market is probably where you'll make more mistakes. But, once you identify a non-trending market, there are certain things you do and certain things that you don't do – for example, you don't use moving averages extensively. When do you use your indicator and when don't you use your indicator? That only comes with experience, after many years of mistakes and many years of trial and error.

J: How much of what you do are you willing to share with others?

RA: I spent my whole life teaching. I share everything.

J: Even the new inventions?

RA: Absolutely. I won't tell you the exact formula(s) of the computerized program, but I'll tell you everything else about it. At the end of my last class I go out with all of my students. I tell them: 'Everything that you learned from me, I apply every day. I don't do it any differently from what I taught you.' That's true. That's the way I was taught. Alan Shaw is probably the prime example of someone who has tirelessly and selflessly given to others. He is quite a human being. He's given me everything, and I in turn give it to others.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior success?

RA: I don't know about my superior success, but I've been in business for a long time, so I must be doing something right. The thing about investing (or trading) is that you have to be honest with yourself and you have to be flexible – that's the human part of it. We all make mistakes, but we must not compound our mistakes. In technical analysis you can correct the mistakes quickly, but you have to have the ability to stand up and admit a mistake. People will respect you for doing so. It's very hard for people to change. When you are practicing technical analysis, you have to be totally eclectic, because there will be a time when the approach that you are using doesn't work. If you are not flexible, you'll self-destruct. I don't believe that any one approach works all the time. There is one thing I always tell people: when in doubt, always default to price. People debate: 'Oh, I am a volume guy,' 'I am a put-call ratio guy,' and this or that. You don't own volume, you don't own put-call ratio – you own price! That's my dictum. If a trend is going up – I don't care if it's going up on light volume – I am with it. If it's going down, I am with it. I own the price. Not everybody will do that.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

RA: First of all, if you are a short-term trader – and I am talking about day-to-day or couple-of-weeks-to-couple-of-weeks trading, which is not what I do – you are more susceptible to random noise. Traders have that problem. All the firms I worked for – and I worked for three major brokerage firms – invariably told us to have a 12- to 18-month time horizon, just like the fundamental analysts do. So I don't pay attention to little jiggles and wiggles. However, being a human being and having to call market turns, I get fouled up by an erratic move or two, which can distort me. But, I've found that if you eliminate a lot of noise, it shouldn't impede or interrupt your long-term outlook. Maybe I am lucky, but I just don't do short-term trading. I don't want to do it, though if I had to, I could, and then I would have to deal with the noise. There will always be noise there. That's why you use stop-losses to protect yourself.

J: Is noise automatically filtered out in long term analysis?

RA: No, it's not necessarily filtered out, it's there. However, the volatility, or the noise that you are talking about, will impact short-term moves, but will never create a primary bull or bear market – it might interrupt it a little bit. Remember what I said to you about the old man who said to the young generation: 'Keep your eye on the major trend.' That's basically what that old man was talking about. Once you have the major trend, forget the noise. Don't get stopped by the noise, don't ever let it bother you. I think that's what he was trying to say.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

RA: That's a great question. I like to be a team player. I think that if I were in charge of a portfolio or a mutual fund, I would always start with fundamentals. There would have to be a reason why I would want to own a company, but always technical analysis would dictate when and how I would deal with a stock. So, under those circumstances, I would want to have both. Now, when you step into my chartroom, you are asking me my opinion which is 100 percent technical. When we put out a market letter, it's a technical market letter – it's not dictated by any other outside forces, except the technical ones. When I go on the road and I am trying to be practical, when I am talking to a large audience, and especially when I am talking to the public, I try to set up a fundamental case to back my picture, if I can, because it's easier to present a position that way. I can't just say: 'Well, you have got to buy this stock, it has a nice bottom.' That doesn't sell it. I could say that to a professional technical audience – they would understand that. But for an audience that's not technically sophisticated, you have to gauge your terms. By the way, I don't use the words support and resistance when I am talking to a non-technical group – I use words like buyers and sellers. When a stock is going up, I don't use the words major uptrend – I say, that it is a momentum stock. I have my audience's attention, whether they are quantitative

or fundamentally oriented. Actually, I think that a successful technician, like any speaker or writer, has to be sensitive to his audience. You have to know your audience and present the subject accordingly. That's where the problem with technical analysis lies – it's not with what we do, it's how we say it. We confuse people with our jargon, so I don't use that – I use words like overvalued and undervalued instead of tops and bottoms. A base is a stock that is undervalued, and a top is a stock that is overvalued. Believe me, fundamentalists understand exactly what that is. If you show them a picture and you explain that what they see is an overvalued situation where you have more sellers than buyers, you have the audience's attention. Most technicians don't know how to do that.

J: So your approach is purely technical – the only time you bring in fundamental analysis is when you are trying to explain your purely technical approach to a non-technical audience?

RA: Yes. At Prudential I created a unique product: it starts with the universe of fundamental stocks that the firm follows. Out of their stocks, I'll take only the ones that are graded as buys. Then I'll ask: 'Out of these fundamental buys, how many are quantitatively graded positive or negative?' So I take that list of fundamental buys, and I run it through the quant screen. Let's say starting out with 500 stocks, you have 200 that are fundamentally attractive. A 100 of them are positive quantitatively. I'll take that 100, and I'll look at them technically. Maybe 75 out of a 100 will look good technically. These stocks by now will have gone through a triple screen, so I call that "trice blessed" – they are "blessed" from fundamental, quantitative, and technical points of view. We do that report once a month. We also have fundamental analysts who have sell ideas. Stocks graded as sells are "cursed." Are they "twice cursed" or "trice cursed," that is, they can be "cursed" from a fundamental, quantitative, and/or technical points of view. Clients love it, because they understand that I am using all three of the disciplines. Although I am a technician, I use those other two disciplines before I get to the technical recommendations. So I do make use of other research disciplines, and it's a very, very popular product.

J: How about political or global analysis? Does that influence the decisions you make in your chartroom?

RA: I have the TV on all the time. I read many newspapers and magazines. I try to follow as much as possible of what's going on in the real world. We can't live in a complete vacuum. Does the news change my market opinion? No, my market opinion is technical. Can it have an impact? Oh, sure. Things like presidential cycles certainly can have an impact. We did a whole study on the impact of wars on the markets. When wars start, the market usually goes up. People don't believe that. That's all history, and it's fun. I think technicians become better fundamentalists. You do it backwards, because when you see something on a chart, you have got to find out why. Charts make us ask why. A good technician is always asking why. That's what I said before – one should tie a story with the chart.

J: How much of your technical analysis is done on an intuitive and subconscious level?

RA: A lot of it. I am not saying I am proud of that, because I think more of it should be quantified. I would say 80-90 percent of it is intuitive. But when you say intuitive, it sounds like I am guessing. I am not guessing. I believe the trend. I believe the tenets of the Dow Theory. That stuff works. I believe in support and resistance, I believe in moving averages – it works. So it's intuitive, but it's also technical.

5.3.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

RA: To begin, you must start with market breadth (the direction of the majority of stocks) because the Dow or the S&P 500 are flawed averages; they are distorted by weighted components. So, if you ask me about "the market," I first find out what the stocks are doing. I look at different kinds of breadth measurements – that's important. Which technical approaches I use least? I don't do Gann analysis, because the old-timers say that Gann is not the kind of analysis you should base a lot of your conclusions on. I have questions with Elliott Wave, only because the people who are really supposed to be good at it and who have quite a reputation, have made huge mistake in the past. There is something wrong there. What I think really works is trend analysis. Keep it simple. Up is good, and down is bad – it really just comes down to identifying trends.

J: How do you test patterns or indicators before you start using them with real money? Do you ever ask for other people's opinion when you are making such decisions?

RA: I've never back-tested them, and I am not saying that's good. I've used patterns for many years, and my experience has been very good as a result. The same is true for those who preceded me. They started using these techniques 40 or 50 years ago, it worked then, and it's amazing how it still works today. The tenets of technical analysis are rooted in the laws of supply and demand. Going forward, quantitative documentation of pattern recognition will enhance the status of technical analysis.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

RA: You have to go back in time to understand the difference between a secular and a cyclical market. I think this current generation is going through a painful lesson of trying to adapt to a changing time. We are no longer is a secular bull market, we are in a secular bear market. Everybody understands that, but they don't know it yet. I grew up in such an environment. I came into the business in mid-60's, which was the time of a secular bear market. The first 16 years of my career was just getting beaten up in the market, but it was

probably the best thing that ever happened to me, because it was a difficult time and it was very instructive. People who did well in those days were those who were less market-oriented and more sector-, group-, and stock-specific. The long term for them was not a matter of decades, as some people say today. The long term for them was measured in months, maybe a year or two. In a cyclical market, like we are in now, you are apt to get a lot of false moves in technical analysis. I know that happened to me in the 70's. You get breakouts that don't work, patterns that don't fulfill themselves. You just have to be flexible. People are probably going to be upset with technical analysis in the next few years, because they are going to see a lot of false moves, but we are prepared for that. Hence, one must use and interpret indicators differently during different market periods.

J: Are there particular patterns or indicators that are especially susceptible to being misleading in today's environment?

RA: In a cyclical market, I think some of the trending tools, some of the moving averages, might not look as well. You have to be a little careful with those, and, at times, when looking for climactic market lows, one might find that important bottoms develop less dramatically.

5.3.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

RA: Unbelievably so. The very fact that you and I are even sitting across from each other is wonderful. I think I was the first MTA person to meet Dr. Andrew Lo. He had never met anyone from the MTA – I introduced him to the association. It was in the late 80's that Dr. Lo started to get a little interested in technical analysis. The MTA furnished him with pricing data. That's how that love affair started, and thank God that Dr. Lo pursued it. He came up with some studies that validate a lot of what we are doing. That's wonderful.

J: So that's one aspect of the evolution of technical analysis.

RA: That's a big part of it. The biggest thing that happened to technical analysis is the Market Technicians Association. In 1975 we started the MTA library, which was the first library of its kind. We lost it in the World Trade Center, but now it's bigger, and we are getting some of the old classics back again. The MTA provides a forum, and, as an organization, it is very proactive. We do a lot of things for people. Mike Epstein, for example, who is both part of MIT and part of the MTA Education Foundation, is doing things that have never been done before – education on college campuses. We have sister societies all around the world now.

J: To what extent has the introduction of the variety of computer software aided the craft?

RA: Oh, the computers have exponentially aided the craft. One of the things they've done is put technical analysis in front of everybody – in the face of traders and all kinds of non-technicians. It's easier to do technical analysis with a computer – you pump in numbers, and it gives you back pictures (charts). It's almost like the computer was made for us. That's the good news. The bad news is that it makes everything look so simple. People think they can read a chart, but they don't realize that it is not that easy. It's not as simple as everybody thinks it is. That's my biggest fear.

Furthermore, computers have enabled people to do the back-testing, which is wonderful. More and more academics are starting to realize that there is value here. Technical analysis provides them with a completely new field in which to investigate. Fundamental analysis has been overrun; the academics have done so much with it – they've turned over that ground so many times. But they haven't done it with technical analysis yet. They will do it, and much will come out of that. First we have to get the establishment to accept us, then the academics will be coming on board more and more. They won't be afraid of technical analysis any more. They won't see it as witchcraft any more.

J: To what extent do you rely on computer generated signals?

RA: I don't use the computer to give me any signals. I don't want that. I have to see things evolve myself. Maybe that's a little arcane, but that's what I want to do.

J: What are the advantages of relying on computer generated signals?

RA: The computer looks for things that I want to see. I ask it certain things that I want to know, but I don't rely on computer-made decisions. If a computer says – 'OK, you have to be bullish' – I would never rely solely on that.

J: Would you recommend other people to construct their own charts by hand?

RA: That's the way I teach it. For 34 years I've been teaching it the same way. I say: 'Do it yourself.' You should start that way. Later you can expand it to computers. Absolutely. Don't stay this way. I am 62 years old and I'll admit that maybe I am just stuck in my old ways, but there is a certain amount of it that you have to do yourself.

5.3.5 The innovative process

J: What drives your innovative process?

RA: That's a good question, and the answer is: the need to know. If I don't understand something, I must do research. That's what made me write my major pieces. If what I am using doesn't satisfy my quest, I need to do more research.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

RA: I think staying with the classic approach is fine. The only reason why I would want to get something new or different is to speed up the process, but I would never eliminate the basic, classical tools. I would get some help in identification and pattern recognition, but I would never change the basic analysis.

J: How soon after you develop a particular technical tool do you make it accessible to public?

RA: It depends. The last big one I did was a relative strength product, and there was at least a year after I developed it and before I exposed it to public.

J: Did you use it yourself during that year?

RA: Oh, yes, I used it extensively.

J: Why do you eventually share your inventions with others, rather than keeping the edge just for yourself?

RA: Well, I don't explain everything in total detail. I explain what I am trying to do, but I don't give them the formula(s). The formula is proprietary, and I tell people it's a proprietary indicator. It kind of makes it a little mysterious, too. It's not all that complicated. I do fairly basic technical analysis – up is good, down is bad. Seriously! I know it's hard for some to believe that, but it's true – the trend is most important. People tend to make more out of the subject than it really is. If I can get anything across in this interview, I'd like it to be: keep it simple.

5.3.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

RA: Throughout my professional life on the Street, believe it or not, I haven't committed much personal money to my stock ideas. And I did that because I knew that if I became too involved with my own money and my own ideas, I would have lost objectivity. So I divorced myself from it. What I would do, I would put my money in a fund, and I would adjust the fund periodically. For example, when biotechnology stocks were doing well, I would put more of my money in biotechnology funds, but I wouldn't look at it every day. So, I can't say I lost a lot of money. I didn't get out of everything in the crash of 2000, 2001, 2002. I could have, but I didn't. So did I lose some money? Yes. Did I lose a heck of a lot? Well,

it was a lot of money, but it wasn't heck of a lot. With that in mind, I can't say that I lost and then learned a lot from it.

Where I learned a lot was from my market calls, because I feel just as concerned if I am wrong and if it's someone else's lost money as if it's my own lost money. In fact, I feel worse if I lose money for someone else than if I lose my own money. For example, the crash of 1987 was very hard for me. I saw something coming, but I did not foresee the magnitude of what happened. I took a lot of people down with me, and people were angry. I think in hindsight everybody said: 'Well, who could have expected it?' But there were some technicians who really got out of the void. I didn't do as thorough a job as I could have. That incident made me very conscious of major risk. Up to that point I understood risk, but I did not understand it could be as bad as that. Since then, I am a lot more attentive to risk. I wouldn't say I am scared, but I run a little bit scared, which is good. In other words, I am always looking over my shoulder to find out where I could be wrong, where I could limit my losses and get quickly out of a situation. So I learned a lot, and that was a very good lesson. It's also an important lesson to learn if you are a trader – you always have got to cut your losses short, as they say.

J: Has it become easier to lose?

RA: It's never easy to lose money – I don't care who tells you that. It's easier to understand my mistakes, because now I don't make big mistakes. I learned from that experience not to take as big of a risk. Or, if I do take a big risk, I am going to get out sooner. So I learned from that and I don't think I've had many big misses since then. I really haven't. I am not bragging or anything, but my market calls have been very good. I tell everybody, I won't catch every move – especially, I won't catch the shorter-term moves, but forget about them, I am not oriented that way. But it would be very hard for me to miss major market moves. I might not get in early enough, but I am not going to miss a major market move. I won't allow it, because I'll change. That's another thing I've learned – you have to change fast.

J: Has a loss ever made you doubt the validity of technical analysis?

RA: Oh, absolutely. That's a great question. I think it was 1977, 78, 79. It was a cyclical environment, and it was so difficult. I was young and enthusiastic, working for a great guy. Alan Shaw was terrific – he caught many major market moves. But there was a period of time – it seemed like a couple of years, but maybe it was only a year – where almost everything we said went the other way. It got to the point where I was very frustrated with technical analysis, and I almost left the business. You know, you feel very bad if you make mistakes and lose money for people. It was getting to the point where I couldn't believe the charts. That's why I understand this current market better than most people; I understand that you can't be as long-term as we were in the 80's and 90's. You can't do that. Now long term may be 6 months instead of a year and a half. So I am willing to change my opinion

much quicker, because we are in a cyclical environment. So, yes, it was in the late 70's that I became very frustrated with technical analysis. I won't say that I've never had that problem since, but I haven't been frustrated with technical analysis for some time.

J: To what extent do your emotions interfere with your craft?

RA: That's also a very good question. We are all emotional. First of all, you have to identify the range of your emotions. Sometimes you think you are emotional when you are really not. By virtue of the fact that I am not as short-term oriented as some of the other people, my tendency to become extremely emotional is lessened. Don't get me wrong, I am an emotional person. Maybe the fact that I am of Italian descent makes it even worse. But does that translate into erratic moves where I am losing my patience? No, I don't get that way. Part of the reason is that I don't trade. If I had to make 4 or 5 very short-term decisions every couple of hours, I would be a basket case. I can go home and think about something, plan my market letters and plan my outlook for the year. And I do it with tools that help me look beyond the noise and take a longer-term view. So, I don't have that nervousness. But I am always watching what I am doing, and I am always very careful about how I write, because I don't want to become slipshod. I am very serious about what I do, but not as emotional.

But I had to learn that discipline myself. In the late 70's, when I was getting whipsawed so much, I actually realized that the Street expects you to make mistakes. When I first came into the business, I thought that everything had to be correct. That's why when I was getting whipsawed in the late 70's, I had so much difficulty with myself and thought that technical analysis was terrible and wrong. But, the truth is, the Street expects you to be wrong. What it wants, though, is honesty, and it doesn't want you to stay wrong. That I learned. I learned to duck. If I am buying, I know exactly the reasons why I am buying, and I know exactly where I am going to get out in case I am wrong. That's what I teach my students – I teach them discipline. You are going to buy for a certain reason and you are going to sell for a certain reason – if those reasons happen, move! I had to learn that myself. I don't want to make mistakes just because they expect me to make mistakes. Of course I don't want to make mistakes. But when I make them, I am going to understand why I made them, try to correct them in the best way I can, be honest with myself, and then move on.

J: According to Joseph de la Vega, "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[4]*." To what extent is this statement true in your case?*

RA: I am not a speculator. That's where I think people are wrong. Many think technical analysis is speculating or short-term trading, but it's not that. When I write, I use technical analysis for longer-term investing. Also, when I teach, I tell people how to use

[4]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

technical tools for long-term investing. I am asked every December to write a forecast for the next 12 months. That's not speculating. That's not looking at the next 10-minute move. That's taking the same tools as short-term traders do, but applying them differently. So that question is relevant for someone who has to make many decisions all the time. I don't have to do something all the time. A speculator is someone who is trading like crazy, I think. And, yes, a trader has the conflict inside; if he has a bad streak of calls, he cannot make up his mind on the next one. I am an investor, and that's a completely different mindset. I dislike it when people lump technical analysis into this category of speculation, as if we were gamblers! That's not at all true. So, I don't have those conflicts. I am not making a decision 25 times a day, and I am not fighting myself. But, like I said, I do make mistakes and I've learned how to handle them.

5.3.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

RA: It plays a great role. But there is a difference between "creative" in a sense of creating new tools, and "creative" in a sense of creating new ideas. I don't need new tools to create new ideas. I am flowing with ideas. Whatever is happening during the day – it might be technology stocks going down or utilities going up – it creates ideas and starts all sorts of bells ringing for me. Maybe the tenor of the market has changed, and you need to find out why. Maybe interest rates are going up – all sorts of things could be happening. Ideas are plenty. Do I need new indicators to get these ideas? Absolutely not. You can't change the basics of supply and demand – it is what it is. Up is good and down is bad, and I don't care how you want to slice and dice it, that doesn't change. It's the understanding of the subject that's important. Now, you can also create new tools, back-test with a computer, and do a number of other things, but I don't even have go there.

When I am taking about creating new ideas, I am talking about my ideas regarding the stock market. I have to write a market letter – what do I say today about this thing called the stock market? Someone might think that by now I've written everything possible about the stock market, but the market is always changing, and I always have new ideas about it. Now, you are talking about the tools that help you get these ideas. I don't change that many tools. I have the same tools. But the stock market itself is so dynamic and so multifaceted that it creates ideas all the time.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

RA: Yes, there is. First of all, there has to be the love for technical analysis. Technical analysis is so much fun! I tell my students in the very first class: 'You are going to love it or hate it.' It's like a game of chess. You are making moves and analyzing things, and you can do that in a number of ways. As you get older, you get down to where you develop a set of indicators that you feel very comfortable with. And you know in your heart that they

don't all work 100 percent of the time, but you've worked with them enough to understand them, to feel comfortable with them, and to know that they are reliable. After 38 years in business I've gotten to that point. I have young people working around me, and they have new things that they use and new ways of looking at things, and I say: 'Fine, that's good.'

J: What exactly are the tools that you are comfortable with and that you consider reliable?

RA: The classic ones – breadth, sentiment indicators, few momentum indicators, moving averages – nothing that you can't get from a book.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

RA: I looked up the word "science." Science is a body of knowledge with its own language and its own axioms. That's technical analysis – it has its own language and its own axioms. So it's a science. Is it an art? Absolutely it's an art. Think of an x-ray. Why is it that one radiologist sees something different in it than another one, and they are both educated in some of the best schools? You tell me, is it art or science? I think it's both. It's a science that really needs an interpretation, and that interpretation is art.

5.3.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

RA: I'll tell you, one of the smartest men in the world that I know in this business is Bill Melloni. He was a hard man, a tough guy. One day he asked me a question: 'Would you rather be right or lucky?' Being a stupid kid that I was, I immediately answered: 'I want to be right.' As soon as the word got out of my mouth, I knew I was wrong. He said: 'I am not paying you to be right, I am paying you to be lucky.' I'll take luck any time. But you don't invest because you are lucky. You invest because you think you have knowledge and discipline – it would have to start out that way. I am using my knowledge and discipline all the time, but the time it doesn't work, I like to have a little luck. But even when it doesn't work, I have to use my knowledge and discipline – I have to know enough to cut my losses short. That's what technical analysis really is – it's risk management. Managing risk is making sure that you don't take a big loss, but luck comes in when you catch one good stock and it doubles or triples on you. You say: 'Wow, I didn't expect that!' That could be luck.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

RA: I have been frustrated throughout the 38 years I've been involved with technical analysis, because people who were critical of technical analysis really didn't know what they were talking about when you sat them down and asked them about the subject. So, for me to be critical of astrology would be me doing that to financial astrologers, because I don't really understand what they do. It would mean that I am very critical of something I don't know about. That doesn't mean I accept them, but I am just being honest and I am saying that I really don't know what they do. I can't just say: 'I've read about it and I didn't agree with it.' But, inclusion of astrology certainly doesn't help the technicians. You'll say: 'Gee, these guys look at stars.' It doesn't play well. This goes back to knowing your audience. You can't tell them: 'I am going to look at Jupiter and tell you when to buy.' No.

But having said that, the gravitational pull of the Earth is a physical phenomenon that keeps the bodies in balance, and it does have a powerful effect on life on Earth. I know some doctors who tell me that when there is a full moon, women give birth more often. One doctor friend of mine who works in an emergency room told me that for weeks he never sees patients with dog bites, then all of sudden they come three or four at the time. He noticed they come in clusters, and he believes it has something to do with a full moon. This is not scientific, but I think there is some truth to it. Since technical analysis is basically studying the psychology of investors, do full moons have an effect on one's trading? I guess so. Could astrology in some offhanded way be beneficial or instructive? I am going to say yes. But they, like technicians, get so involved with their own terminology and they lose their audience. I am not advocating it, I am not banning it completely, I am just saying that maybe some people should do a serious study on this.

So to answer your question, in the long term scheme of things, astrology negatively impacts people's perception of technical analysis. We technicians have a tough enough time. I can't cloak my work in astrology – it would be the worst thing for our credibility.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. are the laws that underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

RA: I think there are kernels of truth in all of them, but to embrace them and to make any one of those philosophies a dogma, is absolutely wrong. This is what I tell all my students: 'You don't hang your head on one hook.' Especially with Elliott Wave, I've seen too many good people lose credibility for staying too negative, too long. I put more credence in Fibonacci, because part of what I do is the retracement philosophy, and I am very happy with it. I am not a Gann theorist.

J: I see. None of these theories are the absolute truth.

RA: No. It's like astrology. Is there some truth or some basis to them? Yes, there is. Is there basis in the Elliott Wave? There is plenty of useful parts in the Elliott Wave. But to

take it and become completely indoctrinated by it is wrong. I would never do that. The only thing that I am going to be 100 percent tied to is price. We are judged by the performance of price. Therefore price trends are paramount.

5.3.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis? Did you become more or less convinced since when you first started?

RA: Almost always. Yes. Otherwise I wouldn't have stayed in the business. I love practicing it, I love teaching it. There was that time in the late 70's when I said: 'Oh, God, this thing isn't working.' Maybe it was my naïveté, maybe it was my lack of experience, maybe it was one of the worst markets in the world, but it was probably everyone of those things. Nothing was working. Now I am a little older, a little wiser, and a lot luckier, and I think technical analysis is fine. So I've become more convinced that it works.

J: Did the lack of credit many academics gave to technical analysis during the early days of your career ever discourage you and made you doubt the validity of technical analysis?

RA: No. I was too naïve to know that that was going on. Then I started to find out that they were so anti-technical, which just made me work harder. I instinctively knew they were wrong. Did I back-test it? No, but I was working with it, and these academics were more involved with the fundamental side of the business. I believed then that they didn't understand "risk." They thought risk was company going out of business! That's just one form of risk. But that's not the risk we deal with everyday. Early on they did not address it. Now they are coming around to it, thanks to people like Dr. Lo, and others. But that only happened in the last 15 years or so.

J: What, in your opinion, is the best proof of the validity of technical analysis?

RA: The fact that folks like me are still in the business. That's proof enough. Alan Shaw spent his whole business career doing it – he just retired. Bob Farrell at Merrill Lynch is another proof. These are wonderful people, and I have the highest respect for them. They are the proof that it's valid. Many people have made major commitments on their market calls over the years.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

RA: Yes, it does bother me. Especially in this day and age when everybody has to quantify everything, it's sad that we don't have more of it documented. So we can't satisfy the people who want it documented, because we don't have enough of it. I am not in a position

to do that. It's people such as yourself who can do that, and hopefully give technical analysis the credibility that it deserves.

J: So, what bothers you is the lack of acceptance.

RA: Yes, of course. We need it.

J: Does the lack of hard and fast rules bother you just because it causes this lack of acceptance by the establishment, or do you also feel that it would be helpful to have some hard and fast rules in your personal practice of technical analysis? Even if technical analysis as it is were completely accepted by the establishment, would you still wish there were hard and fast rules?

RA: I would sleep better at night if I knew that 93 percent of the time an ascending triangles worked! But I don't know if that's the case about an ascending triangle – it may or may not be.

5.3.10 Lifestyle

J: Could you describe your working day?

RA: I get into the office around 7 o'clock in the morning. I live nearby, so it's not that hard to do. By the time I get there, I've already read the Wall Street Journal, watched television looking at the news, all in order to get a feel for what the day might hold in store. As I said to someone awhile ago, when I walk into this building in the morning, I think I know exactly what the market is going to do. Everything seems perfect. But the problem is, when I get in the elevator, I talk to a few people. Then, when I get off the elevator, I am totally confused, because I had to deal with the real world. So there is a lot going on in my head when I get here. Right across the hall is the conference room – I'll sit there at 7:30 AM, and listen to the fundamental analysts. They talk about different industries, and I'll just be taking notes. I'll accept everything the analysts say, but when I step into our chartroom and I close that door, I don't listen to the fundamentals any more. I tell everybody: 'You can do anything you want, but once you step into the chart room, it's a hundred percent technical.' I am religious with my graphs. I wouldn't buy anything that's going down, despite what the analysts say.

Moreover, I am talking with clients and writing all the time. Monday is the worst day of the week – I do considerable amount of writing then, and I give 2 to 3 conference calls. Traders call here as well, and that's a minute by minute application of charting. I structured the office and the chartroom so that it's very free-flowing. The two other technicians are always discussing indicators, market reactions, etc. – the ideas are constantly being brought about. At times, the room is quiet as a library, because we are in the research department,

and we need time to think.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

RA: Can I live completely without stress? No. But I know that I am not going to hurt people in the long run because I believe in using disciplinary technical tools that will eventually kick-in to confirm major bull and bear trends. By adhering to these disciplines I am able to avoid fighting the major trend. Again, technical tools are not infallible but respecting trends is the only way to defend against major losses.

5.3.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

RA: You have to like the subject and the markets. You have to be analytical. You could be an English, history, or French major, and still be a great technical analyst. Many of us enjoy military history. If I were to structure someone's education, what would I do? That's a good question. Since my background is so varied, I don't think there is any one subject that has to be studied. Now, to be an analyst, you have to be able to write. A trader doesn't need to write, so you are talking about two different animals. I don't think any particular formal background is necessary, but the individual has to take a technical analysis class like the one I teach. At the end of that class, they are going to know whether they like the subject or not. And if they are already wound up, they'll study as hard as they can, and they'll do anything they can to improve. But they have to be exposed to it first. Prior to that you can take any class you want to take. You could be anything – a scientist or a history major.

J: What advice would you give to technical analysis students? What is the key to success?

RA: Decide right up front if you are an investor or a trader, then apply technical principles to the timeline most appropriate for your style of investing. Take a class on the subject. Read as many books as you can, and join an organization that promotes the subject. By associating yourself with those who use technical analysis, it will be easier for you to learn from other people's experiences.

J: Is there anything you would like to add that we did not address in this interview?

RA: Everybody has their own interpretation of what a technician is. I know what the past has been for us, but I think the future is changing in our favor and, hopefully, academia is going to play a bigger role in our success. I want to be able to say one day that technical analysis is finally accepted by the establishment, and put on a par with other accepted areas of research such as economics, fundamental analysis, or quantitative analysis. It must be on

the same par with those disciplines. I also hope that people learn to segregate trading from investing – they are two separate disciplines within technical analysis.

5.4 An Interview with Laszlo Birinyi

5.4.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest?

LB: I started my life as a trader after working in the operations departments of several Wall Street firms. In my generation traders tended to be people who came from Brooklyn and Staton Island who were pretty bright and street-savvy, and who would start trading literarily in their late teens or early twenties. At 28 or 29 I was somewhat behind the crowd. I realized that to be successful, I had to close the gap between myself and the other 28 year olds who already had at least 5 years of experience. You can close that gap in several different ways, one of which is to become a really good trader, which is really difficult the markets being the way they are.

Perhaps because I had a good fortune of having taken some classes at the business school – I was getting my MBA at the time at night – I realized that to be successful, to move up the ladder, I had to do something, and I started to become very interested in how markets worked. I looked for all sorts of articles and books on trading and market movements because we were sitting at a trading desk, we weren't looking out 12 to 18 months. So I spend a lot of my time and energy in getting all sorts of articles and publications. One of the issues that I explored is transaction costs. Around 1975, there were only about 5 articles ever written about trading costs, one of which was in Mississippi Review, a really obscure journal. Literarily if you took all the publications about trading costs available at that point, the stack would be only about half inch. So I kept looking for things of this kind.

At the same time, there were many public newsletters – that was a very big business in those days. In fact, it was such a big business that at one point there was something called the Barron's index or indicator where someone would go through Barron's every week and count the number of bullish ads versus the number of bearish ads. Now Barron's is all mutual fund companies trying to sell their products. So what I did was subscribe to all these newsletters, and having been a history major as an undergraduate, I had a sense of trying to compile facts. So, that's when I first got interested in the whole idea of what moved the market and how the market worked. And there was also an effort on my part to move ahead.

J: How about your interest in technical analysis itself as a field?

LB: All the work on markets in short term was technical at that time. That's why I got interested in the whole idea of technical analysis because it gave me a unique input in my dialog with portfolio managers and other traders. Indicators such as the advance-decline line were helpful to me to create a dialogue and to give some input.

J: Did someone or something in particular inspire you?

LB: Not really. In fact, if there was anything it was the lack of inspiration. As I gathered

information, I kept it, collated it, and worked with it. (I should mention too that my first experience out of college was in the computer business. I was a systems analyst so I was used to structures and databases.) The more I interrogated, investigated, and learned, the more disappointed I was that so much of this was clumsy and inconsistent.

One of my contentions and criticisms of this type of analysis is that the range of indicators is almost limitless. Someone once wrote a paper tongue-in-cheek about snow in Boston on Christmas day, relating the amount of snow in Boston on Christmas day to what the market did next week. People would look at all sorts of things. People would have a bullish stance to the market and they would say that a certain indicator was also bullish, and then the indicator would change, but their stance wouldn't change. So now all of a sudden they would talk about volume instead of the advance-decline line. So I got interested in technical analysis because I was cynical – I mean, this wasn't working!

The other thing that disappointed me was the flexibility, to put it nicely, that technicians showed. The market would do something and I would read in the newsletters "as we've been suggesting, the market has done XYZ," and I would go back and review the past newsletters and say, "I don't see where you were suggesting this in the last 4, 5, or 6 newsletters." They would be very vague in their commentary suggesting investors look for solid companies with great prospects. A month or two later after this or that company had risen, they would suggest that those were the exact companies they were recommending.

J: Did you have a mentor? What was his or her role in your development as a technical analyst?

LB: That's one of the advantages I had. I did take a course at the New York Institute of Finance on technical analysis. And again, I sort of walked away with a certain empty feeling, the fact that these people weren't rigorous, they seemed to be following the market instead of leading it. So I set about coming up with my own approaches and my own methodology. One of the criticisms I have of our business is that we do tend to have a herd instinct. If someone is considered good, we follow that person, without continually asking ourselves how that person is doing and if his calls are still good. I just felt that most of these people were just in the marketing business rather than the markets business. So I just did my own thing. We have done a lot of studies over the years and found a lot of things that do not work. Unfortunately that tends to be the case with most of the popular approaches. I don't want to say I was a self-made man, but most of the things I've come up with, I've come up with on my own.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

LB: I took a class at the New York Institute of Finance, but the only thing I got out of it was how to calculate the 10-day advance-decline oscillator. Over the years, I've spent a lot of money buying old books – you may be familiar with Fraser Publishing in Vermont which has all these old market books. I also got the old issues of the *Financial Analysts Journal* and I did a lot of bibliography-type work. Going to NYU at the time, I had access

to a pretty good Wall Street library.

For so many things I found from my experience that the case was not on solid ground. I remember one book where early on the author referred to the famous Sherlock Holmes story about the dog that did not bark, saying that it was from the *The Hound of the Baskerville.* But the story about the dog that did not bark was from *Silver Blaze.* My feeling was, "This guy didn't do his research on English literature, how could I be confident that he had done his research on the stock market?" So, many things fell apart very quickly, and more and more I discarded a lot of ideas and tried to develop my own.

Let me give you one example that came much later. There has always been this contention that the bull-bear ratio is a contrary indicator, i.e. when 50 percent of the newsletter writers are positive, that's an indicator that the market is going to go down, and vice versa. Well, we got all the data since day one, examined it, and found that it is not consistent. Sometimes when everyone is bullish, the market goes up, other times when everyone is bullish, the market goes down. The numbers are pretty random, it's not like 80-20 or 70-30 where the tendency is there. It's just not a very good indicator despite the myth that it's a great contrary indicator.

Later on, we discovered that the odd lot indicator didn't work either. The odd lot indicator was also supposed to be a contrary indicator and if you look at the entire 1980's, the 2,000+ trading days, there are only around 11 trading days when the public was a net buyer. So you might say to yourself, "It really is a great indicator. The public was so stupid because they missed this big rally in the stock market." But you know what the public did in the 1980's? They bought bonds. They bought the US government bonds which gave them double-digit returns and no risk. It was not a bad investment. It was interesting that in the 1990's all of a sudden the odd lotter showed up. There is a huge number of days in the early 1990's where the odd lotter was a net buyer, and the timing was very good on their part.

So as I looked at these things over time, I found they are inconsistent, so I have gone off and done my own thing, which is one of the reasons I hesitate to label myself a technical type person. I call my work "market analysis," because that's what I am trying to do.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your trading?

LB: I started using it almost from the beginning. First of all, it's not a past tense type of situation. Charlie Ellis wrote a classic story in the *Financial Analysts Journal* many years ago called *The Loser's Game.* One of the things he says in there is that portfolio management or investing should be a profession, but it's not. His point was that doctors and accountants practice, where practice means an ongoing learning process. I don't think in our business that we practice investing. People go though their MBA or analyst programs for 2-3 years, then eventually become portfolio managers, and they stop learning. They stop recognizing that the market is dynamic and that it changes. I continually come up and explore new ideas. I think that my partners and I spend a greater percentage of time doing research than anyone else in the business. In fact, somebody once said to me, "you are the only person in

the business who does basic research." So it's an ongoing thing. In direct answer to your question, that's what we do all day long. We are always looking for ideas and approaches. We've been fortunate that we don't have to do very much marketing – that sort of takes care of itself, so it's a continual ongoing process and I've been doing this since 1974 or 1975.

J: So, as soon as you started familiarizing yourself with the discipline, you felt prepared enough to start applying it real money?

LB: Absolutely. Having been a trader, in some cases a position trader where I had to put the firm and their money on the line, I was from the very beginning willing to step up.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

LB: One of the things that disappoints me about the practice of technical analysis is that people don't realize enough how dynamic the market is and how things change. There is a cliché, "it's not your grandfather's market any more." When you have a market which is dominated by traders, when your commissions are 1 or 2 cents a share and even less in some cases, it's totally different dynamics from when you are paying 50-60 cents a share commission as people were paying in 1976. In all investing you look for these wonderful underlying truths, and the more statistically valid they are and the longer they persist, the more confidence we have in them, whereas actually it should be the other way around. We should recognize that what worked when we had a historical classical long-term investor is a totally different environment from the one where you have people who are day-trading. One of the shortcomings is that we still think that charts and indicators work in the same way, while in fact they work differently now.

For example, one of the indicators that we have looked at over the years is mutual fund cash. The contention was that when mutual fund cash got to be above 10 percent, it was bullish, below 5 or 6 percent it was bearish. It was a pretty useful indicator maybe in the 70's and early 80's, but now you have mutual funds which are worth 5, 10, or 20 billion dollars. A mutual fund manager cannot go to 10 percent cash, because at 10 percent cash he is not making a market bet, he is making a business bet. If he is wrong, he is dead. The guy in the 70's who had a 100 million dollar fund and was 10 percent cash could get back into the market in a day or two. Now you cannot do that. The failure in many of these people to recognize what's really going on, how things have changed, and how these changes have affected their approaches, is really disappointing for me.

J: Which mistake did you learn the most from?

LB: One mistake stands out. In 1979 I introduced the idea of ticker tape analysis. Actually, that's not my idea. In fact, that was the first form of analysis. All market analysis stems from the old ticker tape. When we first started doing that, it was a very useful

indicator. What we would do with the first version of it, we would only look at block trading. We would look at every single block trade to see if it was in an uptick or in a downtick, and that proved very helpful. Then we realized that since we were interrogating every single trade to see if it was a block, why not analyze every single trade further, and therefore we developed the idea called money flows.

Money flows proved to be very useful until 1982. In 1982 they did not have quite the predictability that they had previously. The adjustment that we had to make was to recognize that starting in the early 1980's the dynamics of the trading desk had changed. Before then, when volume was much lower, the specialist on the floor of the New York Stock Exchange controlled the market place. You did not really want to antagonize the specialist. He was a partner of what you did.

I still remember trading Motorola in the early 1970's and putting on a small trade without really checking with the specialist to see if he wanted to participate one way or the other. The order came from the floor, from John Coleman, who was one of the great powers and figureheads on Wall Street, "that young man will not trade Motorola again without my permission!"

In 1980's institutions grew, commissions were still very significant, and liquidity increased, so upstairs block trading became a bigger and more important force in the marketplace, and the control of the marketplace went from the specialist to the trading desk. Firms like Salomon Brothers where I worked basically would put on large prints which in those days were 20,000-30,000 shares, and basically tell the specialists that this is what they were going to do and moved out of the way. Our money flow concept was not as useful as it had been because with block trading gradually the information did not seep into the market place. What happened was, more and more prices were being set too often, prices were being set by retail investors. It was a unique circumstance because the New York Stock Exchange was at the time, and to some degree still is, the only market in the world where retail sets wholesale prices. A 100 shares of Ford up a dime is a new price – even though there are many millions shares outstanding, that's the price that shows up on your screen. So we recognized that we had to differentiate between the retail and the wholesale market, and we started doing money flows on block and non-block trades, and we looked at it in different market places. That was an adjustment we had to make.

5.4.2 Personal style

J: Could you describe your own distinct style of technical analysis?

LB: The first element of my style it that we don't do any marketing. My criticism of technical analysis is not so much a criticism of technical analysis as a craft as much as it is criticism of technical analysts who don't recognize what they are doing. They are basically in the marketing business – show up at CNBC, get your name in the paper, speak at some function – that's where many analysts go wrong.

They also go wrong in making dramatic predictions. The best you can do in the market

is give some very strong tendencies and some direction. Because they are in the marketing mode, analysts try to go overboard and be dramatic. I would contend that what I try to do is tell you that we are going to have a cold day tomorrow and a lot of snow. What technicians will try to do is say that we are going to have 6.4 inches of snow and that the temperature will go down 15 degrees. That is impossible, but it is what people like to hear. They like to have this degree of certainty, they like to have somebody who really knows. Technicians cater to that.

So my style, first of all, is characterized by recognizing the limits of what we are doing. Our work is similar to medical diagnostics. You can go to a doctor and have your physical, and if he tells you that your cholesterol in 220, that doesn't really mean that you are going to walk outside and fall over. It doesn't mean that you have 6 months and 3 weeks to get it below 180. It doesn't mean anything except for the fact that you have a high cholesterol reading. You should recognize that eating steak for the next 5 nights may not be a good idea. On the other hand, you might live to be 90 years old and be running marathons in your seventies. I think that's the best you can do in the market. Very few people even get close to being right. The first thing about our style is that we try to find tendencies.

Once a year or so someone twists my arm and makes me give a speech to some of the local groups or to a public organization, which I tend not to do and don't especially enjoy doing, mostly because people would buy your ideas and they would never hear from you again. Our style is unique in the entire business. The common characteristic among technical, quantitative, and fundamental approaches is that they begin outside the market – somebody runs a computer program, somebody goes through a book of charts, somebody goes out and kicks the company's tires. And after they are all done, they go to the stock market to try to verify or prove their ideas. My approach is to dissect the stock market. I ask, "what is going on in the market, what are the trends and the dynamics," and I let the market tell me the story. That's the major difference. I am letting the market direct me in trying to distinguish the trends and the developments in the market which are durable, lasting, and profitable from the noise which is 70-80 percent of what goes on.

J: How exactly do you go about this dissecting of the market?

LB: We do a lot of historical studies and spend a lot of time on them. Peter Drucker once said that the failure of American business is that it knows no history. This is really true in the stock market. One thing I do which is very unique in the industry is actually the idea that I got from Joe Granville. What Joe Granville suggested is that you keep track of the market participants and what they are saying. We have in the past done charts of the market versus comments by well-known strategists and commentators. We started in the mid-1970's to cut and save major news stories. Then we would bind them. It's always a great puzzle to our summer interns, many of whom come from places like MIT and Yale, when they are given scissors, glue stick, and a xerox machine, and then they are asked to cut and save major stories from the *Wall Street Journal* or the *New York Times.* They look at me like, "you are kidding," and I am not. We actually have these clippings going back to

1962. It gives a great input or insight about the sentiments, about what people were talking about, and about what was in the headlines.

Where does this become helpful? One of the stories that I will be handing out at this afternoon's meeting was published in the *New York Times* on Sunday, August 1982, about the bull market. The story said "we are getting there, the rally is coming, but we need to have a selloff, we need to have more people on the down side, we need to have more people get out of the market." They didn't use that word, but basically they were saying that we would have capitulation. One of the great myths is that market bottoms are made when everybody throws the baby out of the bath water, goes to 40 percent cash, and vows never to buy a stock that trades at more than 10 times earnings and doesn't yield at least 8 percent – that is the sound of a market bottom according to the myth. But go back to the early fall of 2003 – we were coming out of the bear market and everybody was saying that we haven't had that final climactic selloff where everybody gives up and sells. If you go back to the story in 1982, that's exactly what people were saying. The story was written by wise men of Wall Street a week after the market bottomed. So the market bottomed and people were still looking at something that they thought would be the ugly bottom, but again, we had already bottomed. So we look at a lot of history to know what to look and what not to look for.

The thing that distinguishes us the most is the idea of money flows. Money flows is ticker tape reading. It's the contention that the market is a discounting mechanism. We find that at the end of the day 90 percent or so of all stocks go up because people buy them and they go down because people sell them, but the 10 percent of stocks which have really significant moves, long-term gains, in which people make or lose unusual amounts of money, are stocks that long before the news have developed have told you so (market being the discounting mechanism). That's really what distinguishes us. That's part one of our style.

Part two of our style, especially increasingly so, is we recognize that in the markets such as we have, which are dominated by traders, to be a long-term investor is not impossible but you have to recognize that the circumstances are different. We know that stocks tend to trade in bands or channels, and we focus a lot on buying stocks that are oversold and selling stocks that are overbought. And again, the only big difference is that we are not suggesting that the stock is 10 percent above its trading range or that it will go down 7.3 percent. We are just saying that this is a stock for which the light is red. You can cross 5th Avenue when the light is red, you just better be very careful. Conversely, just because light is green doesn't mean that you don't have to look both ways, worry about someone making an illegal turn, or some bicycle rider crashing through the light.

So our view is not a view toward absolutes. General Motors does not tend to get above its 50-day moving average, and if you buy General Motors at 15 percent above its moving average, you have to realize that you are making a long-term investment because probability of that stock moving significantly higher from that point in next 2-3 months is not very strong. In today's environment we are focusing more and more on intraday trading and on the importance of information that one gleans from after-hours trading.

J: How much of what you learn from others do you directly apply in your trading?

LB: Very little, because most people who practice technical analysis don't invest. Most commentators – technical, strategic, economic, or whatever – are like restaurant reviewers or movie critics. I have eaten in a large number of the world's better restaurants – having worked at Salomon Brothers I had a chance to go to a lot of places – and I could probably make an adequate food critic. But I am not a cook. I am not about to venture into opening a restaurant. It's very easy for these people to suggest what you should do, and very few of them are actually practitioners.

We had experience at Salomon Brothers with a group of quantitative analysts who allegedly were doing a good job and getting some commission business for the firm, whose calls have been more right than wrong. They realized that to really make the big bucks and get in on the significant bonus pools, they had to contribute directly to the bottom line, so they asked that they be given some money with which they could put their efforts to work. They were given several million dollars, and they did poorly. All these laboratory experiences do not translate into the real world.

I find that most of these technical types and technical models really are not useful in the marketplace. I think the marketplace is telling you that too. I am not aware of any mutual fund which today in its prospectus details its technical approach. Years ago there was one that I recall that focused a lot on the Lowry work. There are very few practicing managers who make their money based on the technicals. They will look at charts, rising moving averages, and very simple things, but very few people today and historically are actually really making money using technical analysis. It's not really very compelling. We have done analysis of the main "chart meisters," and they are not making money. Making a market call is not the same thing as buying a bunch of stocks. They contribute to the noise in the system and they write some things that people focus on, but as I track them, I find that their implementation is getting iffy. First night they suggest that a stock at 38 has resistance at 42, and the second night that the resistance is at 44 and support at 36 – that's not really a prediction, that the actual development.

One of my early experiences and one of my disillusions occurred in 1975. I was on a trading desk, and I was friendly with a young lady who worked for one of the major firms and was at a large technical department. We had a stock at 39 and 3/4 and she called and said: "We are trying to figure out what to do with this stock. At 41 it's a breakout, but what do I do with 39 and 3/4?" In the real world you can't pass this because it's not at 41 – you would be interested in buying it. Nothing in trading and investments is black or white, and we have no room in the trading room for "interesting," "developing," or "potential."

J: How do you learn what works for you and what does not, without making big loses?

LB: Be willing to take little losses. Be willing to realize that if you have huge body of information that leads to conclusion, it's probably not that useful because to get a huge body of information you have to go back in time. One of the things that we are doing now

is developing patterns of pre- and post-trading. So you come in in the morning and someone announces that earning is up 3 points pre-market, from 8:00am to 9:15am, and once we have just one or two data points, we try it, we buy 500 shares. That's because pre-market is a relatively new phenomenon, so you can't go back more than a couple of years.

What I do is think whether something is logical and whether it makes sense, then I do it. I don't need to have 4 decimal points for me to do it. We have trust in the fact that we have enough experience and we try to get a very logical approach. A lot of my ideas, such as the money flows, make a lot of sense and are very logical, but one of my great disappointments is that people don't like it because I don't have 47,000 examples over 27 years with statistical significance. As I keep suggesting, the market changes, it's dynamic.

We have had a lot of success with fundamental and technical type screens. Then we run things through our programs – we see if the money flow is positive, we check whether we are in an overbought situation, etc. We had a program last summer where we took 3,000 stocks and looked for things where market multiples were less, earnings forecasts were on a rise, etc. Three thousand stocks turned into 175 stocks, then we run them through our programs and 175 stocks turned into 13 or 14. We made 500 basis points over the S&P over the next 30 days.

J: Is your analysis more effective when you are working by yourself or when you are working with others?

LB: I would say that I work by myself in a sense that everybody is hugely subordinate to me, not that they have to be, but most of our staff is 20-somethings. One of my disappointments is that they don't talk back enough. They are not aggressive enough relative to me. I encourage people to step out on their own. Someone told me yesterday that the firm has a totally different character when I am not there – people are much more jovial, they talk a lot more, they yell at each other. When I am there they are quiet at their desk, which is unfortunate, because I would like to think that I don't force that kind of environment. We have a very successful firm, and there is no reason for us to become compulsive or that focused. So I guess I am it.

J: In general, is technical analysis better done working individually or in teams?

LB: It's probably done better individually if it's done at all. Again, I have a problem with technical analysis because of technical analysts. One of the things that I learned years ago is that the newsletter which talks about stocks on pages 1 and 2, bonds on page 3, and commodities on page 4, is not going to work. Salomon Brothers, even Henry Kaufmann in his heyday, would not even venture into talking about the stock market. Everybody would ask him about stocks, and he would say, "go see our stock people, they are really good." I have a contention that an arithmetic increase in the number of predictions you make leads to a geometric increase in difficulty. When I run into somebody who can tell me about growth stocks, utility stocks, etc., I tune him out, because he can't do them all.

J: In what kind of market conditions do you make most mistakes?

LB: Probably in the bear market, because in the bear market you push the string too much. I found too that in the bear market, if you do the right thing, the customers aren't happy. Customers like everyone else want to make money. We have had problems in the bear markets where we had high cash and people said, "we are not paying you to do that."

We did the most complete study ever done on market rotations. It was 3 volumes and 2500 pages. We found that in the last quartile of the bear market absolutely nothing works. There are just no hiding places. People are pushing you and as a result you push yourself to look askew at the indicators so that you can make money instead of recognizing that sometimes it's useful to be in cash.

J: How much of what you do are you willing to share with others?

LB: We publish our research. We have a very significant institutional product. We have a newsletter and a website. We share all of our work. One of the disappointing trends we have in the business today, especially on the institutional side is that people aren't interested in the market any more. People aren't practicing investments. Now too many asset managers are in the business of just collecting assets, getting more and more money under management, just getting you 50-60 basis points a year, just grinding out these numbers, and the whole idea of performance and market achievement has really gone by wayside. When twenty years ago we had dinner with a bunch of money managers, we talked about the market; now they talk about how much money they raised. I had lunch recently with a very senior practitioner at a very serious institution – they are just in and out of the market with the aim of scattering those 70-80 basis points.

J: You are 100 percent transparent with what you do?

LB: Yes.

J: Now, if all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

LB: I understand the market, and having been a trader has helped me gain that understanding. For example, one of the issues with money flows, which I will keep coming back to because that's what I associate with, is that it looks like a chart. People who are familiar with charts try to interpret it in the same way, so they look for certain points where the money flow trades through the price. But it's a totally different thing, because what we are doing is we are analyzing the tape. We may have a pattern where stock is going down and money flow is positive. People have a lot of problems with it. They say, "how can a stock go down when people are selling? What does it mean?"

If you are sitting there on a trading desk, you have seen that situation in real life a 100

times. Say you have a stock that's down 1/2 or 3/4, it's down 5 days in the last week and a half, and it just doesn't look good at all. Say it's broken its 50-day moving average and hit a new low, and yet you see positive accumulation. Someone will come in and talk about the dismal appearance or disappointing action in Johnson and Johnson, General Mills, or whatever. As an old trader, I know he is a buyer. What happens is, since you know or since you should know that he is a buyer, you tell him that you've been in touch with some sellers. You tell him, "I have a portfolio manager down the hall who might be able to use General Mills. Why don't you see if he can make an offering for you?" So you contact your position trader. The stock may be trading at 50 and 1/4, so you say, "I can offer you 15,000 shares at 50 and 3/4." And again he tells you that the stock is going down and so on and so forth, to which you respond with, "well, let me call my sellers again," and you say, "I can sell you 15,000 shares at 15 and 1/2." He says, "done." Somebody is buying stock. When somebody is buying stock aggressively even though it's in downtrend, that's the kind of thing that we look for. So many people don't understand how this works in the marketplace.

One of our longtime clients was a gentleman who was responsible for equity sales and trading in a very major firm. This firm had all sorts of resources, including a technical quantitative group, a whole gamut of market approaches. He paid us a very significant amount every year to help him prepare his semiannual or annual presentation to senior management, because he needed to have input as to what was going on in the market and as to what the market dynamics were. He needed trends, issues, and the like. It would have been shocking if people in his firm knew how much he was paying on a side when he had all the resources in the house. But the truth is, I don't think that many people who practice technical analysis really understand what's going on in the market. Probably less than one percent of so called chartists could actually sit on a trading desk or go in there and make things happen. That's the difference. I know what it means when people are buying stock that's going down – that's smart money.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

LB: We want to see in money flows at least two weeks of continual persistent buying as the stock goes down or sideways. Consider a stock like Apple. At the end of 1997, Apple went from 10 to 7. In that first quarter as it went down, there was something like 150 million dollars worth of buying on the upticks and being on the offering side on the downticks. That's not random noise. That's now a raw trader, that's the market. In the money flow approach we want to look for a lot of money verifying us, and not just one or two trades or one or two institutions over a very short period of time.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

LB: We've had a lot of success over time combining disciplines. To me a discipline is like

one hand clapping – it doesn't really do much. It's when you add another hand that you end up making noise. We pursue a lot of journals and newspaper, and what I like to see is a stock recommended by someone who is a visit-the-company, tear-the-balance-sheet-apart type of person, as well as by a chartist. Then we put our own overlay on it. To us those are the most desirable situations where we tend to be more aggressive.

J: How much of your technical analysis is done on an intuitive and subconscious level?

LB: The whole issue of sentiment is underplayed in the market, partially because it's very hard to measure it, though you do have bull-and-bear ratios and things like that. I look at a lot of newspapers stories and articles and at what people are talking about. I think it's in chapter 8 of his *General Theory* that Keynes talks about long-term expectations. He says that the market is like a beauty contest, and the critical issue is not to pick the prettiest girl, but to pick the girl that everybody else thinks is the prettiest. That's not always easy to do, but that's where we think that our approach is helpful. Furthermore, being very smart and educated, Keynes thought that the stock market would be a good place to pick up some lose change and pay for a few dinners. He subsequently lost a lot of money. One day he had an epiphany. He said, "I realized that the critical issue in the stock market is not the business cycle, it's the psychological cycle." To use the psychology is critical.

One of my more dramatic and correct calls occurred when after the invasion of Kuwait the money bottomed before the market, and as the market was bottoming people were buying. During the entire fourth quarter of 1990 when everybody was worried about the upcoming conflict, about the republican guards, etc., the market said "it's over, the war is over, it's not a big issue." If you go back and read the stories, the conventional wisdom was that you should sell in the forth quarter in 1990 and once the war begins, the market would drop 200 points, and then you should buy. You may recall that the war was expected to be somewhat dramatic and difficult, but it was over virtually on day one. We had a very strong money flow circumstance, but we also had a very negative view. Everybody in the business was overwhelmingly negative and was saying "wait, wait, wait." There was a story on December 10 of 1990 in the *Wall Street Journal* where I was pictured arguing that you don't have to wait for decapitulation and that the market is already suggesting that we're past the war, and nobody could believe that. The second week in January of 1991 one well known strategist was arguing that the market was going down to 1500. To me that was really reinforcing my view that everybody was on the wrong side. So I had the intuition kicking in.

J: Could you put a percentage on how much of your analysis is done on an intuitive and subconscious level?

LB: Having had so many years of experience and having been in business for 30 years, I am sure there is more than I probably recognize. If I had to put a number, I would say it's 20 percent and it's declining. One of the things that make markets and trading difficult is that every day you have 50 different experiences, and you forget how you felt Monday by

Thursday. We are trying more and more to catalogue this. What do you do if a stock reports good earnings and is up 3 points and then goes up another 2? What do you do? Right now I think a lot of people are acting intuitively and we are trying to catalogue more and more of these situations so that we know what the tendencies and trends are. We are trying to identify situations that we can quantify. I am trying to at least give us a roadmap. I am trying to say at least 60 percent of the time it does this, 20 percent of the time it does that, 10 percent of the time it does that, and the other 10 percent of the time it's totally random. I am trying to get the percentage of my analysis that's intuitive as close to zero as I can.

5.4.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

LB: The advance/decline line is a hugely overdone technical indicator. If you go back as we did and plot the advance/decline line cumulatively, you'll see that it peaked in 1957 or so, really long ago, and that peak was not surpassed until the last six months. So from 1957 to 2002 this indicator was still below its high level mark, therefore suggesting that you should stay out of the market.

In 1999 one of the great issues was market breath. Every technician, every quantitative analyst, and anyone with access to computer, calculated the 7 stocks that were accounting for the majority of the gain in Nasdaq, and the 10 stocks that were accounting for 60 percent of the game in the S&P. I wrote a piece called *Market Breadth* back then where I argued that it doesn't matter how many stocks are going up, it matters which stocks are going up, because S&P is a weighted index. So you could have 50 stocks up and 450 down, and have a flat number. To me that showed how little people really understand about how the market works. For example, you have to realize that Wal-Mart is twice as big as all the other stores combined.

You have to distinguish between indicators that are descriptive and indicators that are indicative. Advance-decline line is descriptive. For example, in 2004 we had a strong advance-decline line, which basically said that you ought to buy a lot of stocks. It was not a good stock picker's market. I fact, almost 25 years ago there was a fourth strongest S&P advance-decline line, but only the seventh strongest S&P gain. So the averages actually understated what happened in the marketplace. It basically says that it wasn't a stock picker's market, it was an asset allocation market. So advance-decline line is a descriptive indicator versus an indicative indicator which tells you that something is going to happen tomorrow.

Indicators that I consider most useful are probably moving averages. We are doing some work now where we are testing the golden cross and the iron cross ideas, and we are getting some respectable results. More and more, stocks with rising 200-day and rising 50-day moving averages are OK. I would not buy them on that basis, I would validate them on that basis. If you are dealing with stocks that don't have these characteristics, you have to realize that you have to work a little harder to get that stock going. But those would be two traditional things that we look at the two extremes.

J: So a moving average is an indicative indicator?

LB: I think so.

J: You also said that moving averages are quite useful, whereas advance/decline lines are less than useful.

LB: Yes.

J: In general, is it the case that the indicative indicators are more useful than the descriptive ones? Is there a particular descriptive indicator that you like to use as well?

LB: Most of the indicators are descriptive. There are very few indicators that are indicative. Even the golden cross rule has to trade through something that's happened. Very few things tell you something is going to happen. Even the moving averages don't tell you that something is going to happen, except perhaps that nothing bad is going to happen. If you have a stock with positive 50-day and 200-day moving averages, nothing bad is going to happen, the opportunity for surprise is limited. That's really about the only one that I give a lot of credence to, as far as traditional things go. But then you also have the things that we have done.

Money flows is the best indicative indicator that exists. I should suggest too that going back to my days with Salomon Brothers, because of our success with money flows, especially when they were not known and when they were limited to us because we were calculating them ourselves, we were able to make a lot of money because we were able to tell the trader, "you want to be short on this and long on that." We were helpful to the trading desk to know where the action was.

For example, our first version of what we call the block monitor, which was the printout of the ticker tape every day, would point out that Gulf oil usually trades 3 blocks a week and that last week it traded 10, where 8 of those 10 trades were upticks. So you could see that someone was buying the stock. If a lot of institutions came looking for an offering, you knew not to short close to the last sale. As a result I was given a lot more levy, a lot more flexibility, and a lot more money.

At one point we had 23 people in my group, and we looked at indicators left, right, forward, and backwards. We were not trying to do anything academic, we were trying to find the ones that make money, the ones with which we could go to the desk and say, "OK, this is the seasonality that exists, a chart pattern that works." We knew that chart patterns in total didn't work, but we hoped that maybe in the rounding bottom it worked for the industrial stocks or financials.

A desk is not an academic endeavor. All I want to know is what to buy and what to sell, and I don't care how you got to that conclusion as long as it works. But we looked for other things, we looked at them objectively, and they worked. We tracked newsletters and

research reports. One of my great disappointments was with a major brokerage firm which quarterly put out a chart book, where every quarter they would say, "here are stocks which have rounding tops or V bottoms, and so on and so forth." They would identify them clearly as positive or negative patterns. When we tracked them over the next three months, all the positive patterns produced negative results and all the negative patterns produced positive results.

One of the case studies that you may want to look into is in *Wall Street Week*, where about 24-25 people who were panelists of the *Wall Street Week* had to put together the portfolio every year. At the end of the year you open the envelopes and find out who the winners are. I think 5 or 6 of those analysts were considered chartists or market analysts, and they were not very good. Only 1 or 2 of them over that 10-year period appeared in the year-end show, and I appeared in the year-end show 6 times between 92 and 99, and at least on 3 of those occasions, I was number one.

If you look at it objectively, you just find that we've tried to find things that work, and in part because we weren't lazy. There is a Bloomberg function called "BTST," which backtests 6 indicators, including MACD and Williams oscillator. For example, if you type in "Citybank btst," you could find that 1 or 2 indicators worked over a certain time period, but the others didn't. So we always tried to find something that would work and that would make us money.

J: Do you also rely on classical reversal and continuation chart patterns?

LB: No, because we tested them and they did not work consistently. Once in a while they worked.

J: So you would consider chart patterns to be unreliable?

LB: Yes, very much so.

J: You said that money flows is one of the best indicative indicators. What's one of the best descriptive indicators?

LB: Advance-decline line is a good descriptive indicator. It told us last year that to be in the market you had to buy 400 S&P stocks. In 1999, Janus noticed that 10 stocks were moving and accounting for most of the game, so they bought those 10 stocks. While most people were having discussions about what does this mean, is this good or bad, Janis said, "10 stocks have gone up, let's buy those 10."

J: Are there indicators that are completely useless both from the descriptive and indicative standpoints?

LB: I think volume is a hugely useless indicator.

J: Is it even useless to use volume as a confirming factor?

LB: Yes. One of the things that we did in "Market Cycles II," which is a 1,000 page publication, is we looked at a number of indicators. The only indicator we found that tells you the bear market is about to end (it doesn't give you the time and the day, it just tells you are near), is public shorting exceeds professional shorting. There are two theories about volume in bear markets. One is that heavy volume tells you that you are at the end of a bear market, because heavy volume means everybody is giving up, selling, and getting out of there. The other theory is that there is low volume at the end of the bear market because everybody is out, no one is there to sell any more, it's only buyers. So we looked at it, and we found that sometimes bear markets end on heavy volume, and other times they end on very light volume.

J: How do you test patterns or indicators before you start using them in real trading? Do you ever ask for other people's opinion when you are making such decisions?

LB: The answer to part B is no. Again, I do something different than other people do. Other people are writing commentary, I am earning money. There is a very significant difference. One of the things we do is basic research. What we do is similar to what you do for your Ph.D. thesis: We go to the library, we do bibliography, we get old sources, and we go through them. By looking at the historical, we found that many things just don't work.

Let me give you an example. There is an indicator called "3 steps and a stumble." This is something that Edson Gould articulated years ago. We tested it. One of the things we found, that made it not even worth testing, was the fact that late in his life, shortly before he died, Edson Gould wrote that "3 steps and a stumble" doesn't work. The guy that wrote the book later told you that it doesn't work! So we begin by getting all the information.

The difference between what we do and a lot of research that's done on Wall Street lies in the fact that Wall Street research begins with a conclusion. They want to prove that something works, so they find those data points which support their idea. We get all data, work through it, and end up with a conclusion. We start from ground zero. But more and more, because the market has changed so much, because we have hedge funds, because we have ETFs, because we have ECNs, we find that there is no precedent. In terms of electronic trading, one of the things we look at is what's happening in the foreign markets, because those markets were doing electronic trading before we were. It is disappointing to find out that SEC has not done enough of that sort of research to find out what does happen with the electronic markets. So it's almost like an academic type exercise: We get all the information, see what has happened in the past, and move forward.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

LB: The market changes constantly, and so does a great majority of indicators. Things like the NYSE specialist purchase/sales or mutual fund cash no longer play the role they

once did. In the past people believed that foreign buying was reflected in the first half hour, but that's not the case any more, because so many stocks trade more often. There used to be a time when if you went to a Wall Street desk, no one could give you a clue as to where the Nikkei closed. The attitude was, "that's Japan, what does that have to do with our market!" So many indicators are not keeping up with the market as the market changes.

Things like options expiration can give you a distorted reading for a day. Excluding hugely exogenous events like 9/11, markets tend to be changing in a gradual way. The whole idea of hedge funds and day trading has been an evolution. So certain indicators over time have become less useful.

One of the things that have happened that people don't or don't want to recognize is that 50's and 60's probably good times for technicians, because a chart reflected what happened. In the 50's and 60's, if a stock opened up half a point, the chances are that by the end of the day it would be up a quarter or three quarter. Now a stock can open up 2, trade down 3, go up 4 in the afternoon, and close unchanged. So, on a chart you'll see that there is no change, yet there was this tremendous amount of movement during the day, all this intraday activity, because you have so many more noises.

In 1974 we had 3 economic indicators that we looked at (including the CPI and the PPI), whereas now we have every Fed report. It's very frustrating when at 8:30 something like consumer sentiment comes out and it's good, then at 9:30 something else comes out and it's bad, and at 10 o'clock a third indicator comes out and it's bad. You have to decide which one is most important, which one is the market focusing on. You have indicators such as consumer confidence, which is a very iffy poll, I don't think it's a scientific sample at all, and yet people hang their hats on it because everybody has an incredible short term focus.

Remember that until a few years ago you had to pay a lot of money to get real time quotes. We didn't have cell phones, we didn't have stock market tickers in elevators, we didn't have CNBC. When I went to Wall Street in 1969, after 6 o'clock on a weekend, you could not get anything to eat south of Canal Street, unless you wanted to go to the South Street terminal to get a greasy hot dog. If you needed to work later on the weekends, you either brought your lunch, or you walked down to the South Street terminal. I lived in Uptown New York and I would meet people in bars. They would ask me, "where do you work," and I would say I worked on Wall Street. They would then say, "Wall Street! Do you know John? John works on Wall Street." People didn't work on Wall Street! You had kids from Yale whose fathers owned seats on the NYSE, and a couple of other kids from Dartmouth whose fathers worked at Brown Brothers, and that was it. It was a very isolated part of the world, and very rarely did it actually make the news.

Again, I can't emphasize enough the fact that it is a dynamic situation and that in the 60's or so charts probably worked. A chart opened up a half, and it traded 200,000 shares – that was real information. Now you can have a stock go up and down, trade 5 million shares, and remain unchanged, and yet 4 million of that was done at very high or very low levels – the point is, you don't know.

J: Is the number of indicators you follow greater when your trades are larger?

LB: No. It's the case that an arithmetic increase in input corresponds to an at least geometric increase in difficulty.

5.4.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

LB: It's become more publicized, because there is just more media. You now have *Smart Money*, *Money Magazine*, CNBC, etc., but there is a need for input and content. CNBC does 15 hours a day of talking heads. There have been some dramatic developments that have brought technicians to the fore.

I don't think it's any better. I think that people practicing technical analysis 20 or 30 years ago were probably more diligent. Joe Granville really did some very good work; his books are really very good. Jim Dines' book, which is hard to get nowadays, is pretty good. But you could be good in those days, because, like I said, if a stock opened up half a point, the chances are that by the end of the day it would be up a quarter or three quarter, whereas now you have all this intraday activity going on.

The odd lot indicator was useful in those days, because the odd lots constituted 10 percent of volume. So, as far as the odd lots are concerned, in those days we were not talking just about sentiment, we were talking about the actual supply and demand. So the indicators more reflected what happened. When I came into the business, the market opened at 10 and closed at 2. News was very limited. For a long time, there was no news on the floor of the NYSE. There were no quote machines on the floor of the NYSE.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions?

LB: We have, maybe because of pride, looked at most of these things ourselves. Over the years I've been subscribed to numerous technical analysis and financial publications, and I just found that one cannot substitute mathematics for experience. A lot of the things that I've seen are very cumbersome and impractical; it's obvious that they are not being done by practitioners. The problem is, these financial publications authors want to prove something, so they keep messing around with numbers until they prove it. Whenever I see something that says that if you take stocks that have X characteristic of 4.213, you get a certain result, that tells me that if you take stocks with X characteristic of 4.214, you don't get that result. So, basically, they know what the answer is, so they devise the formula that yields the desired answer. I would say that by being a good consumer, I just found out that much of this stuff doesn't work. Other people would say that I am being cynical. So I've done a lot of the things myself, because I don't espouse what these people say.

There is an old trading story, where one gentleman is having a dinner with his friend, when he finds out that this friend is going to have a duel the next day with someone that he's

had an argument with. So the gentleman says: "Aren't you worried about getting shot?" The friend replies: "No, I am very good. I can shoot the heart out of ace of spades at 20 paces." And the gentleman says: "That's great, but can you do it when the ace of spades has a gun?" So it's one thing to do it in abstract, and it's another thing to do it in real world situations.

In my own experience, we've hired many people over the years who have been very bright, capable, educated, and articulate, and they know what to do, except when it comes the time to do it. I remember on one occasion I was out of the country and I had hired a gentleman to do all the work. He was very bright, and everything was in place. The market was down a lot, we had been in a lot of cash, so I thought it was a good opportunity to buy stocks. So I asked this guy, "What did we do today?" He said, "I spent 40,000 dollars." We had 50 million dollars, and this guy spent 40,000 dollars!

J: To what extent has the introduction of the variety of computer software aided the craft?

LB: It's one of the things that try to substitute experience. I am not anti-computers, in fact my first job was as a programmer, but one of the things that I recommend individuals who have a portfolio of 10 stocks, is to track the portfolio on the daily or weekly basis by hand. I tell them to actually physically write those numbers using a red pen and a blue pen. You get a sense of what's going on by actual doing it.

There is a book published on the DJIA, tracking it from 1885 to 1970, and there is about 20 mistakes in there. We don't realize potential weakness of data because we are getting it off of a machine. If you do it by hand, you start to get a much better feel for and understanding of the data.

Let me give you another vivid example. Two weeks ago there was a story in the *Wall Street Journal* on corporate buybacks. There they argued that corporate buybacks was at something like 270 billion dollars in 2004. They got it from *Thompson Financial*, who probably got it from computer. I am sure they went to an index or a bibliography, looked up buybacks and added them all up, and that came up to 270 billion dollars. We started in 1985 to keep track of buybacks and we still do it today. And the way we do it is, every day when I read the *Wall Street Journal*, I circle buybacks, and we look at the couple of other places as well. We do it by hand, daily, and we keep track of it. The number that the *Wall Street Journal* printed (270 billion) was off by 80 billion. I can give you a list of corporate buybacks in 2004 which totals 350 billion. So you have to do it by hand, daily. You can't substitute computerized data for that.

J: To what extent do you rely on computer generated signals, if at all? What are the advantages and disadvantages of relying on computer generated signals?

LB: I look at them, but to me, what a lot of this work does, is it helps me focus my attention. For example, my overbought work tells me which stocks are overbought. But I don't buy them as a basket. I look at them and look for reasons for what's going on. For

example, Apple computer was grossly overbought last week, but Steve Jobs was speaking at a conference this week and Apple's earnings were due on Wednesday. So I asked myself: "Do I really want to sell Apple just because it's overbought? Maybe something good is going to come out. There is a possibility that he may make a good announcement and that the company may have good earnings." It turned out that earnings were really good, and the stock went up. So a lot of the indicators are useful to me in that they help me segregate my thinking.

The beauty of money flows, especially in the 90's when we were very strong, is that it would tell us, for example: 78 or 80 percent of the S&P 500 stocks are going to do basically what the market does (they may be 50 or 100 basis points better or worse than the market), but these 10 or 20 have a potential to do a lot better, and these 20 or 30 have a potential to do a lot worse. I think that what happens with most money managers is that they focus on the stocks that aren't doing anything, and they don't spend their time wisely. We spend a lot of time finding out where we want to look and what we want to pay attention to. Every day I ask myself, "what is this morning's frontier?"

So, the main advantage of computer generated signals is that they help you narrow down the pile; out of all of the S&P 500 stocks, you can find 20 that you really ought to be paying attention to. The main disadvantage of computer generated signals is that they are not adjusting for the dynamics of the market.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

LB: I think it's a good idea. I don't do it, because I am dealing with 100,000 pieces of information every day. But it helps you get a sense of the price and of what happened that day. I don't think it's because charts work, but if you do what I suggest with red and blue pencil, if you are sitting there with 10 stocks, and on 8 of them every day you use the blue pencil while on the 9th and the 10th you are using the red pencil, that should tell you something. The physical act of doing it is very, very important.

J: Did you do it yourself by hand in your early days when you first started?

LB: Actually I did. I kept blue books, where every day I would mark what the Dow did, where it closed, what the advance-decline line was, etc. The physical act of writing down something like "the market is down 20 but the advance-decline line is positive" makes you pay attention to that information.

J: Do you just write down the numbers or do you also plot them on a chart?

LB: In those days I just wrote down the numbers.

J: Nowadays, do you also look at charts?

LB: Yes, but I let the computer make the chart for me. However, I don't think a chart is very useful as it does not capture much of the intraday fluctuation. It is mostly useful for looking at things such as moving averages.

5.4.5 The innovative process

J: What drives your innovative process?

LB: Just seeing what's going on in the market and realizing that we are not picking it up, realizing that 75 percent of activity is programmed trading, and realizing that when you have decimals there is a different circumstance. On a higher level, it's probably because this is the most democratic industry that exists – Wall Street never cares where you came from or who you are – and I would like to see that continue, though I don't think my children will have the opportunities I had.

J: So it's becoming less democratic?

LB: No, I just think it's becoming less innovative.

J: Do you and to what extent collaborate with others during your innovative process?

LB: Not at all. Most people in this field are in the marketing business. Some of the major firms publish reports talking about how great their calls are, and yet they are calculating their performance in a very unique way, which I think is very misleading and very disappointing.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

LB: From day one, ever since I started getting all these newsletters and reading them. First of all, I was sitting in front of the tape and sitting on the trading desk, and I just felt that people writing the market newsletter were in the marketing business and really didn't know what was going on in the market. So my contention is not with technical analysis; it's with technicians.

The classical technical tools were probably pretty useful in the 60's and the 70's, because what you saw was what was happening, but they are no longer useful since the markets have changed. Now you have the surface market, which is just price, but then you have the other dimension of what happens intraday. So the classical ideas, like Joe Granville's On Balance Volume, were probably very, very useful in their day. But now, 5 million shares on a stock that's up a half doesn't mean that 5 million shares traded up a half.

J: How soon after you develop a particular technical tool do you make it accessible to public?

LB: Most people do not accept a lot of this because they are not satisfied with the intuitive and the logical. They want to see a lot of supporting data and backtesting. The problem with money flows is that despite the record I had, especially in the 1990's, which was arguably the best record anyone has ever had in terms of market forecasting and stock picking at the same time, people are never satisfied with me telling them that something is going to go higher, because they want to know how much, when, why, etc. I would say that it is going to snow a lot tomorrow, but they would be dissatisfied because I could not tell them whether it would be 6 inches or 8 inches. Unfortunately, the market is not that cooperative.

J: Why do you share your inventions with others, rather than keeping the edge just for yourself?

LB: I do that because when we started our firm it was a research firm, and only later did it morph into a money management firm. I think it's a very good business model. It's also very profitable; our newsletter business is not huge, but at one point our profit margin was 94 percent. I still enjoy doing research, even more so when I get paid a lot of money for it.

J: You don't think you would have made more money if you just kept the edge for yourself?

LB: No, not really. We do act upon it, but very few institutions actually listen to me. Even the subscribers of our work like to have the reasons, the rationale, and the goal, they like to have all the fundamental stories, and somehow this idea that the market is discounting something isn't satisfying to people unless they know what it is discounting.

J: But even if it were the case that people were listening to you and following your advice closely, would you still share your inventions?

LB: Yes, but I would probably charge them more.

J: Wouldn't that take away the edge from you?

LB: No, not really. The marketplace is so large that I doubt that it would do that.

J: Are there tools that you developed but never shared with the rest of the world?

LB: We developed a lot of tools that didn't work which we didn't share. But we share everything that works. We don't want to compete with our customers.

J: How often do you use the technical tools you developed yourself?

LB: That's what we do 80-90 percent of the time.

J: What kind of technical tools do you use the other 10-20 percent of the time?

LB: Things like the sentiment and moving averages, which I think are important. There are a lot of Bloomberg functions that I look at, especially the "BTST" function, but for the most part we are just really comfortable with what we have invented.

5.4.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

LB: I felt very disappointed when we lost a lot of money. I was disappointed at the fact that we lost sight of our discipline. The discipline continued to be useful. Over the years I have learned how decimalization affects trading and how the whole marketplace has changed. I've learned that the idea of fast trading has made a havoc of old approaches. But it has not become easier to lose, and I still feel badly.

J: Has a big loss ever made you doubt the validity of technical analysis?

LB: No, because we recognize that you can never touch every base. Some of my customers are disappointed that I cannot get it 100 percent right in the market. I've read enough about the market, I've looked at it, I've lived it long enough to realize that it's like with your body – you can eat all the right things and do all the right things, but you can still get hit by a car. I never look at things in the market as totally black or totally white. Maybe that's just the wisdom that comes with age, but that's the reality of the marketplace. For example, 9/11 was totally unforeseeable.

J: How is the way you apply technical analysis different when you are more cautious compared to when you are less cautious?

LB: Not at all. It's because of the analysis that you are being less cautious or more cautious, it's not the other way around.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

LB: Hopefully it's become lesser over time, but emotions do interfere because of the clients. One of my best performing accounts this year was one of my biggest, because we

know that the gentleman has an awful lot of money and that if he loses a couple a million dollars, he is not even going to notice it. Then we have other clients, and we realize that for them their IRA represents 85 percent of the net wealth, so we are a little more cautious and hesitant with those people, but unfortunately that's sometimes detrimental. For example, one of the great stocks of last year was Apple computer. The Apple computer today is trading around 75. For the rich gentleman we bought stock at 33 and made a lot of money on it. I didn't buy it for some of the other clients, because the multiple was too high and technology was not doing well, so we taught it was a little bit out there on the risk curve. But for the rich gentleman, if we had lost, it would have been too bad, it would have not bothered him too much. So to the extent that I feel responsibility to my clients, the emotions interfere with my practice.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

LB: I don't think it can be learned, especially in our case where we are running individual accounts as opposed to a fund. We know the people, we know the individuals, and we can't segregate that emotional factor. Other issues come into the picture as well. You do get depressed about the market. The year 2003 was a very depressing time, it was hard to pick up and buy stocks. It was just a very difficult period.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[5]*." To what extent is this statement true in your case?*

LB: In the beginning I took it home. You don't want to lose a job which is paying you 5 times the average wage of most people. But after a while you learn that the losses are going to happen and that it doesn't matter that much economically. I am no longer building my career – I've been there and done that. I could leave this tomorrow, and I wouldn't have to worry about this day to day. And quite frankly, if I didn't have a 13-year old at home, I would leave it, because I still have a lot of things that I'd like to do and that I am not doing. So I am a lot more segued, comfortable, and wiser than that quote implies. You are going to be wrong many times, and I just try to learn from it. And, very candidly, I've been successful.

5.4.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

LB: For most of the work being done in technical analysis, creativity is a non-issue.

[5]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

There is a lot of marketing being done. If you read the newsletters from today, you'll see that they are very similar to the newsletters from 20 or 30 years ago – they still talk about volume, brakeouts, and chart patterns. One of the most unfortunate characteristics of the practitioners of today is that they have no creativity. If you go to a major firm, they have these chartrooms with charts going back to 1940 or 1960 – they don't want to throw them away and they don't recognize that things have changed.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

LB: You have to be disciplined and you have to have some breadth in your life. The truth of it is, I don't see many of the people in this business doing a lot of work. It's all very superficial, it's all designed to make a reputation and get your name out to the public. I encourage my staff to read a lot of books and do a lot of different things.

One of the great influences on my thinking over the years was a gentleman by the name of Marshall McLullen. His point was that technology and structural changes have ripple effects, and you don't know where they end up. That has happened in the market. For example, who knows what the effect of ETF's is? I am terribly concerned about what's happening with ETF's and ECN's. What happens if we have a position or a circumstance where all of a sudden in a year or two we have a billion dollar fund that decides: "I don't want to own any drug stocks, but I'll buy a drug ETF." So you have a billion dollar pool which owns no stocks but is 100 percent in the market. What does that do to everything?

So I think you have to have people who have some breadth. I just read *State of Fear* by Michael Crichton. It's very interesting how he describes the scientific process, how we look at things, how we investigate and do research. I think those things are helpful. One of the great ingredients in my whole background is that I probably spent more time in my last 2 years of college playing poker than going to class.

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

LB: Yes, I think so. This is a very clear business. If you recommend stocks that go up, the world is very efficient in finding a way to your door. Most people really don't do work. I heard someone 3 weeks ago refer to Edson Gould's 3 steps and a stumble – if they had done the research, they would have found out that he himself said it didn't work.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

LB: I am not really qualified to answer that question. I would hope not. I would hope that experience has some value. But I will admit that more and more firms are trading stocks using algorithms which are apparently much more successful than the traders.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, tech-

nical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

LB: It should have a very healthy dose of science, but it should have some art in it as well. There should be a recognition that sometimes indicators have to be adjusted for circumstances. For example, we would have stocks that show up in our work as very positive, but when we look at them, we find that they are hugely overbought, so we have to make adjustment for the fact that yes, under normal circumstances this is very much a 10, but that's already reflected in price. So market analysis is fluid, because the market is that way. The worst thing you could do to the market is to have 3 decimal point numbers, because the market will change and bite you. So the art comes into the picture as you adapt your strategies to the new environments.

It is also an art in a sense that it is subject to interpretations. People start with a view. Somebody would articulate 12 reasons to be positive, and reasons 1 and 7 would no longer be valid, so they would be replaced with 2 other reasons. When reasons 6 and 4 don't work any more, you just get rid of them. I just felt so many times that technicians were saying, "the market is going up, so let's be positive." This is what happened in December of 2004 in the stock market – all of a sudden people started buying stocks because the market was going up and not because things were better. Too often, stock has good earnings and all of a sudden everybody is positive the day after. Most technicians are not leading, but lagging in their opinions. That's my contention. There are very few technical indicators that are leading indicators. If you look at the advance-decline line, every advance-decline line of the bear market has bottomed on the last day. So what happens is, when the market turns up, people get bullish.

J: Is the stock market itself a leading indicator of the economy?

LB: No. The stock market, the bond market, and the economy are in sync about 41 percent of the time.

J: If most of these indicators are lagging, how do you make predictions about the future?

LB: Money flows, sentiment, and some guessing. What I've done very well historically is money flows, but with decimalization they are not the powerful tool they once were 10 or 12 years ago.

J: What do you mean by guessing?

LB: Just reading the paper and coming to a conclusion. When I read the paper in the fall of 1990 when everyone on Wall Street was bearish, at the end of 2000 when everybody was bullish, or at the end of 1994 when everybody was bearish, that told me something. More importantly, when you interrogate the rationale, you find that behind the newspaper

articles there are weak arguments.

In 1995, one analyst came up with a very dramatic forecast that market was going to appreciate significantly and they got a lot of publicity for it, but when I read it I said, "these are not very compelling arguments." One was that the US was a good and strong country and a leader in technology. That's not the kind of thing that I want to put money on.

I also recall a story where the author had read a lot of the Wall Street Journal stories from the 1960's when we had a bull market, and that reminded him very much of today. Well, that's not very substantive. After John Kennedy was assassinated, there was any number of comparisons between Kennedy and Lincoln: they both had second cousins whose first name was Tom, and they both had mothers who were born in September. These are just random pieces of information. That's what bothers we the most – people publish these reports where they are using random pieces of information and trying really hard to prove their case.

5.4.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

LB: I would hope it's very little. I would like to think that we certainly do not depend on luck. I don't ever count on it or hope for it. When you are running money, it's different from when you are giving advice.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

LB: Yes, absolutely, as do some the other indicators, such as the hemline indicator. One summer, we sent an intern to the Fashion Institute of Technology, to find out how hemlines change with time and if there was some kind of telling pattern. It didn't exist. The astrology is the same way. People have to remember that the stock market goes up or down, and just because two things happen at the same time doesn't mean they are causally related. If you were somehow able to get huge amounts of data, you would probably find some indicator that has 100 percent correlation with the market. It might be baby birth in Latvia or new red car sales in California. The correlation could be absolutely perfect, but it doesn't mean that the two things are linked.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

LB: We have a catalogue of major news stories going back in time, and we've done charts of what people have said at various times – the results were lousy. There is some contention that the Dow Theory is very useful, but we've used the data to examine the validity of what Dow theorists have said, and the record is very disappointing. None of these things that you

mentioned in your question make you money.

5.4.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

LB: I was disappointed in it almost from the beginning. I felt that there was a lot of information in the marketplace, but that too many technicians and strategists were not in the market – they were in the office. Technicians would ask me things like, "Why does an uptick trade have to be a buy?" That kind of question can come only from someone who has never been on a trading desk. Let's say you are trading US steel, the US steel is at 27.5, and somebody comes in and asks, "where can you sell me 10,000 shares?" You say, "well, I don't want to sell you 10,000 shares." The customer says, "but I am a good customer," and you respond with, "OK, I'll sell you 10,000 shares at 28, up a half a point." At that point the customer says, "I buy." Right now you know you lost money. Right now you have your lunch just disappear. And sure enough, 10 minutes later, news comes out and US steel is up another dollar or two. And you sit there and say: "Hm, I got picked off. Not only have I lost money, now my boss is asking me where I am going to work tomorrow." So scientifically you cannot prove it to me that an uptick is good news, but I can prove it to you unscientifically.

J: Did you become more or less convinced since when you first started?

LB: I've gotten less and less convinced because we've gotten a lot more into marketing. There are a lot more opportunities for people to be on TV and in other media. Joe Granville said that if you are going to be a newsletter writer, the way to be successful is to take some really ridiculous stance – no one will ever remember if you are wrong, but if you are right, you'll get a lot of publicity. That's what this is about. George Soros made 2 billion dollars betting against the British pound. They don't tell you all the other times he lost millions betting against the yen. I am not sure how well he's done overall on his big currency bets, but we are always reminded of the one big win. That's unfortunately what this business is more attentive to. So you have to make a splash.

For example, last year or the year before, someone who had made a pretty good call on gold was a top ranked technician, despite the fact that their other calls were lousy. At the very beginning of the rally in September of 2003 as I recall, they were telling people to short Microsoft and IBM. That was right at the bottom! People lost a lot more money shorting IBM and Microsoft than they ever made buying gold. But that one thing stands out, and unfortunately making a dramatic big call is all it's about right now.

J: So over the years you've become less and less convinced in technical analysis but more and more convinced in your own methodology?

LB: Yes.

J: Do you consider your own methodology technical analysis as well?

LB: I consider it market analysis. If you really think about it, money flows may be the ultimate fundamental tool – it's measuring the market's opinion, where the market is discounting something significant that is of fundamental importance, rather than looking at brakeouts or golden crosses. For example, in 1994 GTE showed significant accumulation, and that told me that everyone's interest rate forecast was wrong. That was fundamentally important.

J: Do other people consider your work technical or fundamental?

LB: They consider it technical.

J: Did the lack of credit many academicians give to technical analysis ever discourage you?

LB: No. It encouraged me to come up with my own ideas, with the ideas that were valid and which stood rigorous testing.

J: So you would agree with the academics in their discrediting of technical analysis.

LB: Absolutely. If you go back and look at the record, you will see that so many times so and so said you should buy stocks and the market went straight down. I wish it worked. If someone's stock picks worked on a consistent basis, I could have put my feet up on the desk and just bought those stocks all the time. But they didn't. The other issue I have with technicians is that they don't really recommend. They tell you that things like rails are developing an interesting pattern or that you should be very careful about airline stocks. What does that mean? I am very careful about every stock! Don't tell me that something is poised to break through its 50-day moving average on the upside, tell me what to buy and sell.

J: What, in your opinion, is the best proof of the validity of your methodology?

LB: Our record.

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

LB: Yes. In the end it's the whole notion that this is value added, that this can enhance your investing, that it can add to your returns – I haven't seen it happen. There are 8,000 mutual funds, and I don't see any of them using this as a primary tool. There could be some

20 million dollar fund in St. Louis that does that, but it's nobody prominent.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

LB: Terribly, because it allows you to pick a stand and then find things that support your stand. If I was a practicing technician working for a Wall Street firm, I would say: "Here is my model. Here are the 25 things we are going to look at, and it's always going to be the same 25 things; if 13 of them turn negative, you turn negative." Instead, what happens is, the market is going up, so technicians say, "let's be positive," because after all you get paid for going along. Nobody wants to be an outcast. I think Weinstein had a whole list of indicators that they looked at and I think it was pretty consistent. What bothers me is that people look sometimes at this and other times at that, to justify their case.

J: Do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

LB: No. The truth of it is, technical analysis doesn't work in the market, so I see no reason for it working in these other contexts. I think technical analysis would work with something like FOREX. One of the things about the market is that you have different people doing different things – some people are hedging, some people are buying short term, some people are buying long term, some people are buying income. In FOREX everybody is doing the same thing, everybody is trading in the same place, all the information is captured. In FOREX and in some of the commodity markets, technical analysis is much more useful, because there is consistency, and it's all charts. They don't sit there and talk about all these random indicators. But in the stock market, I think there is no question that it doesn't work. One of the things that I have against it too is that if you go to a major brokerage firm which has significant technical operations, the traders in those firms do not depend upon on the technical groups, which to me is pretty indicative of something.

J: So why do they have the technical groups then?

LB: For the public. They are like fortune tellers that say something good and make people feel better. You feel good when someone tells you will meet a handsome man who is rich.

5.4.10 Lifestyle

J: Could you describe your working day?

LB: I come in at 7:30-ish. I check what has happened overseas. I look at our tools, including a sheet that gives me a technical stance to the market by looking at the S&P

advance-decline line and the spread from the 50-day moving average. I look at stocks that are overbought/oversold, and I look at what news events are likely to happen that day. When the market opens at 9:30 I reassess everything. I work off the market – I look at what's happening in the market and what the trends are. We do a lot of daily pattern recognition. We know that if the futures are down 1 percent and the market opens down 1 percent, there is an 85 percent chance that the market will rally. That's a very useful indicator. Then we look for opportunities to day trade or get into a position that we may want to hold for a short or long period of time. In the afternoon I may do a little bit of research or have meetings with people to direct them what to do, but quite frankly, I am not nearly as industrious as I was 20 years ago. When the market closes I go home. I let the young people stay. I find that today's managers are not as interesting as the managers of 20 years ago, and that they are not as interested in the market. Back in the old days we still had a lot of old people around who listened to the market and focused on the rhythm of the market. Now everyone has an MBA, and everyone follows the same sort of model.

J: Which aspect of your job do you enjoy the most?

LB: Coming up with new ideas and indicators, seeing how they work, and using them to make money. So research is probably still the most fun.

J: How many hours each day do you spend practicing technical analysis?

LB: Probably 6 hours a day I am practicing, trading, and investing.

J: How long is your working day?

LB: I usually leave around 4:35. I also work for 5 hours Saturdays, going over the portfolio. I may read research reports, articles in journals, or new books that come out for an hour or two every day. I try to find flows in their thinking and see if that's an opportunity for us. For example, I keep reading about the housing bubble and how the housing stocks keep going up. I'll keep reading, and when they stop writing about the housing bubble then I'll start to worry. You know, I've never seen a bubble which people have identified at the time.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

LB: I can live without stress, but I can forecast future price moves only to a degree. I can only forecast price moves out 3 months, not a year. Let me give you an example. Last week Starbucks came out and said that December sales were somewhat below expectations. Now, if you own Starbucks, you have got to realize that every month you are going to get a data point and you are going to get 4 quarterly earnings. So if you own Starbucks, there

are going to be 16 incidents over the next year. If you are bullish on Starbucks, you are in effect saying that all 16 of those are going to be at least neutral or positive. Because December sales were disappointing, Starbucks was down 15 percent, and that's the problem with having a long term horizon because you have got all these short term bumps. So if I have a 3 year horizon on Starbucks, I have 48 of coming incidents any number of which can take the stock down 15 percent. And if 2 of them occur in a row, then the situation is even worse. If you are doing quarterly reporting to clients, you easily can have one quarter which stinks. That's tough, and charts aren't going to help you, because charts should give you the long term perspective, if they work at all.

So, yes, I can live without stress because of experience, age, and success. I did well in the 1990's, we put a lot of money away. I've always run the business in a way that if things collapse tomorrow, we can just walk away. We don't have debt or large obligations. I've always run our business on a view: "We are going to fail, so let's make sure that we don't hurt ourselves when it happens."

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[6].

Would you agree with de la Vega? To what extent does your trading control your life?

LB: This is definitely a business of A personalities, and the people who are successful in this business are consumed by it. The best book I've read about the stock market is the *Money Game.* Adam Smith in the *Money Game* says something along the lines that if you are not consumed by this business then you are not going to be successful, because most of the players are consumed by it. Most of the players are A personalities. It's not really for the money, he says. We could be doing this for whale's teeth or beads. The main thing about the players is that they are playing to play. And, as someone once said, the best next thing to playing and winning is playing and losing. For the really successful traders – not the technicians, but the real traders, the real portfolio pros – this is what they eat, sleep, and breathe.

When my daughter was in a very posh nursery school in Manhattan, on Father's Day, all the fathers would come in with their 3-5 year olds and get down on their knees to play with their kids. For all I remember, after about 20 minutes everybody would be talking about the market. So for about 20 minutes you can pay attention to your kids, then it's like, "what do you think is happening in the market."

[6]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

That's the business. These are people who have found their role in life. People like myself couldn't even dream of doing anything else. We would be total dismal failures in anything else that we did. Mike Epstein is one of the few people who have escaped. For most of us, after this there is no afterlife.

J: This quote holds in its full intensity in your case?

LB: Oh, yes. That's what makes us good. It consumes us. We are not satisfied with the mundane.

5.4.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

LB: Somebody once said to me 20-25 years ago that 25 percent of money managers in the US were art history majors. It's not the case anymore, they are all MBA's now. But I think you have to have a broad background, and you have to be well rounded. History is my background, and I found that a lot of our work encompasses history. Anything that is rigorous – mathematics, computer science, engineering – is more favorable than art. People who are successful are people who have the discipline. When the market is going up and people have buy ideas, it's very hard for you to stand up and say that according to your indicators the market is going down. So any formal education that has a disciplinary aspect to it would do. A background in English or foreign languages would not be as good, (although I think Ned Davis's major was French).

However, the actual choice of major is not as crucial and the discipline and the well-roundness. The problem with some people is that they get too limited in their scope, and they take it personally when their charts don't work. I recognize that our work isn't going to work all the time. We spend billions of dollars on weather forecasting – we have satellites, computers, databases – and we still can't predict the weather. It's still very much a random event. We know that every four years El Nino comes around, but that's all we know. We have no knowledge of its shape or nature. If you recognize that, you won't try to come up with 3 or 4 decimal point accuracy.

J: You were a history major but you worked as a computer programmer?

LB: Yes. I was fortunate to have been exposed to computers while in college. It helped me a great deal. In the early days of computing – and I am talking about the 1970's and the 1980's – all the computer people were geeks. There was this huge gulf between the computer department and all the other departments. One of the reasons why Michael Bloomberg hired me at Salomon Brothers is that I could talk to the computer people. I could tell them what we needed to develop and, at least to some degree, how it could be done. They could not snow me with technical terms. So one of my first jobs at Salomon was to interface between

the trading desk, where I was, and other departments.

J: Would you say that having a background in computer science is important?

LB: Not any more, because everybody knows enough computer science today. You don't have to have that kind of scientific background today. Back in my day, computers were this huge black hole in which only MIT graduates and few others dared to venture.

J: Is an academic background in economics and finance important, or is it something that can be picked up in a working environment?

LB: It's worth having some knowledge. Although I have an MBA for all it's worth, I feel I've never used it. I don't think it helped me very much.

J: What are you looking for in people when hiring?

LB: I am looking for someone who is hungry, ambitious, innovative, and who wants to be successful. I am looking more for character skills than for background skills. I've had a lot of success over the years at Salomon Brothers hiring English or history majors. Those were the people who couldn't get into business but wanted to be in the business, so once they got into the business, they were really hungry. Someone had said no to them 23 times. They could not get an interview at Merrill Lynch. Having worked so hard to get their foot in the door, they appreciated it. They did not think it was their right to have a job on Wall Street, as MBA's do. So they came in and they worked harder, they were more productive and industrious. They were more desirous of learning than the MBA types who just felt that that was what the world had called them to do.

J: Does being aggressive and pushy help in this business?

LB: Being aggressive and pushy helps to a very, very limited extent. I like to think that I made very few enemies. People who succeed are people who are ambitious and intelligent about it. Very few people are successful in the business just by doing their job well – it's the people who go beyond their job and who want to grow that are successful. Michael Bloomberg was a good trader, but not great. What made him successful was realizing that the quote machine could also be a computer terminal where people could have a database at their fingertips. Michael Bloomberg has an engineering degree, so after trading all day long, he stayed at night to work with the computer department for 4 or 5 hours a night, 4 days a week, to create the database he envisioned, which later became Bloomberg. No one said to Michael that that was part of his job.

J: What advice would you give to technical analysis students? What is the key to success?

LB: First of all, learn the craft. Before you can do what I do, which is to criticize technical analysis and come up with new indicators, study the old indicators and understand why they don't work. It's not enough to say that the advance-decline line doesn't work – you have to find out the reasons. It's because it's an unweighted measure, and the S&P is a weighted measure. So first you have to understand the language that technicians are speaking before you can deviate from it.

The second thing is, literarily work. Even when I was a Vice President at Salomon Brothers, I was reading the newspaper every day and clipping out stories. Another thing that helped me a great deal is that I was somewhat cynical. I don't want to say it in a negative way, but the more I listened to what people were saying, the more I asked myself, "how does he know?" So I would ask these people, "you said something, how do you know?" And the response would be, "everybody knows that." So I would research these things and I would find out that no one really knew.

I'll give you an example. In the 1980's there were a lot of LBO funds. If you read the newspapers in 1983 or 1984, every story said that LBO funds had raised 25.2 billion dollars for investments. Deals would come, new funds would be raised, and yet every story said 25 billion. I said, "Wait a minute, it can't still be 25 billion 3 years later!" So this questioning attitude helped me.

When corporate buybacks became an issue in the mid-1980's, people would throw these numbers around. I remember one story that I told many times where somebody wrote in *Barron's* that in the first quarter of 1985 corporate buybacks totaled 11 billion dollars. Because corporate buybacks were part of my daily job at Salomon Brothers, I called a friend of mine at this firm and said, "Your guy was quoted in *Barron's* as saying that corporate buybacks totaled 11 billion dollars in the first quarter, and I am very curious as to where you got that number." He called me back and he said: "What he did was he went through *Barron's*. He didn't actually go through the first quarter. He went through the first 2 weeks and another week, and he figured that those weeks were sort of typical of the quarter." So every day when I read the *Wall Street Journal* of the *New York Times*, whenever there was a story about buybacks, I started to clip it out and punch in the data into a computer, and in 3 months we had a pretty good database. Every day we did it, it took a minute and a half. If we missed a day, it took 10 minutes, and if we missed a week, it took 2 hours, but we had and still have the best database on corporate buybacks that exists.

Because I questioned, we did huge studies on market cycles, literarily 2,500 pages. Everybody is always talking about rotation, but how do you know that small stocks do well in the first part of the rally? "Everybody knows that," people on Wall Street will say. If you go back, you find that in half of the bull markets small stocks outperformed, and in the other half they didn't. So we got all the data, analyzed it, and we now have the most complete study of group rotation and movements in the market, just because we asked questions.

Those are the kinds of things that you have got to do. Ask questions, ask yourself "how does he know," be suspect, be a good consumer. If you want to elevate yourself above the grind, you have to look for opportunities, because no one has ever done well by doing what they are told to do well. So when customers ask me what the 10 biggest days in stock market

history are, I give them 15. When they ask me for 20 stocks with highest PE's, I give them 25 and the 25 with the lowest PE's.

Unfortunately – and I've hired a lot of people over the last 30 years – very, very few people get it. They all think that this is just like college. Every 16 weeks you get up another notch – you go the class, take notes, do the homework, and you get up another notch. The difference between college and business is that it's not how it works in business. In business you have jumps and you have plateaus. When the opportunity arises, you can take advantage of that opportunity and move to another level. You then stay at that level for a while and when another opportunity arises, you may be able to move up to another level. Unfortunately, you can't teach that. I've tried and I've tried, but very few people can get it. Most people start off on Wall Street making 75,000 dollars, and 15 years later they are making 400,000 dollars. But people like Mike Bloomberg are rare.

5.5 An Interview with the Ned Davis Group (Ned Davis, Tim Hayes, and Robert Schuster)

5.5.1 The early days

J: Mr. Schuster, what and when first triggered your interest in technical analysis?

RS: I read a book by Norman Fosback called *Market Logic.* It basically went through and historically tested various indicators. One thing that people don't truly understand is that technical analysis isn't just charting patterns. There is a lot more to technical analysis, there are various fields within the discipline, and some people specialize in certain fields and they ignore other fields. *Market Logic* basically looked at developing indicators based on history, and testing them for relevance predicting what's going to happen going forward. I found that fascinating. And I had done some other reading regarding chart patterns, and it was fun. I was pretty naïve at the time, but that's sort of what perked my interest.

On top of that, when I was studying fundamental analysis (this was back in the early 80's), I just found that it didn't work. These people would be on buy signals, buying the stock, and the stock would just keep going down and down and down. It was really obvious that something was amiss with only looking at valuation and fundamental factors. And the fact that at least one aspect of technical analysis is trend following just made perfect sense, because you reduce your risk if you follow a trend – if the stock is going down, you get out of it, if it's going up, you buy it. So that was my first exposure to technical analysis. I also read some books by Granville, who back at that time was a huge name in this field. Granville obviously understood some of the problems with technical analysis, including the various ways in which people get very subjective with some aspects of it. But, like I said, I sort of gravitated towards the area of historical testing.

J: You mentioned some of the books that you have read. Did you have a teacher, or did you do it by studying the literature on your own?

RS: Most of it I just studied on my own, because at that time I was in high school, and there really weren't any classes you could take on this.

J: How much time did you spend studying technical analysis before you felt prepared to use it in your trading?

RS: Given I was fairly young, it was probably a solid 3-5 years of researching and studying it. In the interim, in college, I got inundated with the academic side of things, which took some time to overcome – you are just sort of jelling these things in your mind for a while. So, it's probably a solid 3-5 years before you get comfortable with something, and then you can use it in the real world. That's the bottom line here.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

RS: The number one thing is money management, and the true value of being consistent in your methodology, in your discipline, in following your rules. It doesn't make any difference whether you are dealing with technical or fundamental analysis. If you want to make money in trading or investing, you have to be consistent in your approach to the markets. I also believe that you need to be able to test the indicators or the methodology that you are using, and you didn't really see a lot of that in the litterature. You saw testing, but I am not sure that it was of the same quality as the testing you probably needed to evaluate the indicator. And I will also say that in the academic world I was exposed to a lot of testing that just wasn't relevant. So that's probably one of the biggest turnoffs that I had with the academic approach – they were testing indicators or methods that were fine from the theoretical standpoint, but that were just wrong when you actually had to implement them in the real world. I think that's a big flaw in the way they go about testing.

J: Which mistake did you learn the most from?

RS: Two mistakes come to mind. One is not accepting some risk. You are at times in a position where you want to be a risk manager and limit your downside, but you become so timid that you just can't pull the trigger. That's a big mistake. And the exact flip side of that is the adherence to stop-losses and the money management aspect of investing. You really have to find a balance. This is a mental game that you have to play with yourself – you have to conquer your emotions, fears, and ego to be able to effectively execute your plan. So I say the two mistakes are: one, being timid and unable to pull the trigger, and watching the opportunity loss; and, two, not adhering to a stop-loss, watching the investments that could have made money turn into losing investments, and not knowing when to get out. So you have a big emotional factor that you have to deal with.

5.5.2 Personal style

J: Mr Hayes, in your experience, is technical analysis more effective when practiced individually or in teams?

TH: I think individually, because in technical analysis you really need to draw upon your own experience in using the technical tools. Ultimately, you should not have a team. You should set up your indicators in such a way that they would update when the data comes in. If you can quantify and objectify the process, then you really shouldn't need a team in that it shouldn't require that kind of subjectivity that the team approach might lend itself to.

J: How about in developing these indicators, would you still say that the individual approach is better than working in teams?

TH: It's probably different. I'd say that in developing the indicators, it would be helpful to use teams from the standpoint of having the feedback it terms of what is most useful. So, the team work would be more applicable to developing the indicators.

J: Would you say that most of the patterns/indicators/strategies that you use are in the public domain?

TH: Some of them are, but the way we use the data and the way we use our indicators are not necessarily widely acknowledged. The answer would be, I'd say, some of them.

J: What is it about the way you use these tools that accounts for your superior returns?

TH: We use our extensive historical database and our computer program to quantify how an indicator has worked historically in terms of developing signals. This is what is different in the way we approach it. There are others who do this, but we are probably not as subjective as others who use technical analysis. What makes our returns superior is that we can have confidence when we've tested these indicators historically to the extent that technical analysis is based on repetitive tendencies. If something has had a repetitive tendency to produce returns in the past, it is likely that it will have that tendency going forward as well.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

TH: That's a constant factor. The tendency of a signal to whip is part of what needs to be recognized if you are dealing with short term indicators. If you accept that random noise, accept the small losses, in return you will get some really big signals that will give you big games. And, over time, your system will work in that you will have good returns and perhaps quite a few small losses. If the losses are an issue, a way to get around it is to develop indicators that generate signals less frequently, require a filter or a screen, or require that a move is intact to the extent that there can be more confidence that this is an actual reliable signal and not just random noise.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

TH: I think it is more effective when combined with fundamental analysis because then you really have the whole picture. There is no reason to exclude some valuable information just because it's not technical analysis, to the extent that fundamental analysis can also be quantified. In other words, if we call fundamental analysis something based on monetary, economic, or earnings data, we can quantify the impact of that data on the market performance, the particular sector, or stock performance. Then that can be useful. We might use

the interest rate indicators to call the stock market, but we would be using the momentum of interest rates, which is essentially a technical approach, to call the stock market. So, we can combine the approaches as well.

J: Would you say that most of the indicators you develop combine the two approaches?

TH: No. I would say that where the approaches are most combined is at the model level. When we apply the actual strategy, then we combine them. The individual indicators tend to be separate. What we tend to do is combine our indicators into models. So we may have 3 or 4 technical indicators, 3 or 4 fundamental indicators, and put them together for a composite picture.

J: How much of your technical analysis is done on an intuitive and subconscious level?

TH: Certainly we would not provide recommendations to our clients based on anything that's purely intuitive or subconscious without some kind of confirmation by the actual indicators. But I do believe that when you look at a chart there certainly is an initial reaction that one gets in terms of this being a low risk or high risk situation, or in terms of there being opportunity or danger of decline. I think that does apply, but I think it's always a safer bet for us to use the confirmation of the indicators.

J: Do you try to confirm your initial reaction with the indicators?

TH: Yes, but not necessarily try to confirm it as much as see if your initial reaction is right. There are so many indicators – you can always find those that will support your view. It's better to have good indicators. Suppose you have a hunch – let's say you haven't been looking at gold for a long time, then you look at gold for whatever reason, and it looks bullish to you. Then you should look at the indicators to see if, in fact, they are bullish. If they are bullish, that would confirm your view. That's probably the best way to go about it.

J: What happens if you initial reaction is in one direction, and an indicator which you consider to be reliable points in a different direction?

TH: I think I would definitely go with the indicators. That's what you should do, of course, but human nature is not always such that one would do that, but that's certainly what you would want to do. And having been in the business long enough, you eventually realize you are much better off going with the indicators, because you are going to end up making money or giving the right recommendations if you do that.

J: Do you encounter situations where several indicators, all of which you consider reliable, give different signals?

TH: Yes, because you have indicators that do well based on different things. Indicators are generated in different ways, so it's not inconsistent to have that type of mixture especially when the market itself in a neutral or indecisive mode.

J: What do you do in that case?

TH: It's a matter of understanding the indicators. Some indicators are based on following the trend or the tape. Other indicators look for extremes, they are called overbought/oversold indicators. So you could very well have a bullish signal on a trend indicator, but then your overbought/oversold indicator would say that on a somewhat shorter term basis the market has high risk – in that case you would hedge yourself a little in your portfolio, and you would be in a more of a mixed situation at that point. There is always going to be a scale of exposure to the market in terms of how bullish, how bearish you would be.

J: Do you in that case bring in your intuition to decide which one to follow?

TH: Depends on what kind of trading or investing you are doing. I think in most cases in that situation, if your intuition is that it is going to go up, you would take a bullish position, but then you would want to hedge it with either options or futures, or with other stock that might be more defensive, whatever it is that's your objective.

5.5.3 Favorite patterns and indicators

J: Mr. Hayes, what do you consider to be the most and the least reliable technical indicators?

TH: The most reliable technical indicators tend to be the indicators that give you confirmation based on the breadth of the market, in other words, indicators based on many stocks and many sectors taking part in a move, either on the upside or on the downside. These indicators can recognize if you are at a potential turning point on the upside, because then you are going to see fewer stocks taking part in the advance. They also can indicate when you have extremely oversold conditions, because then you are going to see a lot of stocks dropping at the same time. Breadth indicators, if you understand how to use them properly, are basically a measure of the momentum of the market. The least reliable indicators, which we don't really use here, are those based entirely on forecasting or Gann analysis, that is, some of the more forward looking types of indicators.

J: How is the way you apply technical analysis different when you are more cautious than when you are less cautious?

TH: I don't think there is really a difference. In different situations, the indicators will have different appearances and do and say different things, but you'll still apply them in the

same way, because you'll still use them to find out whether the market is healthy or not.

5.5.4 Evolution of technical analysis

J: Mr. Davis, how has the craft evolved since when you first started?

ND: When I got started, which is now 30-35 years ago, mostly it was chart pattern recognition. That's pretty much what the craft was. There were some people doing relative strength analysis, ranking stocks by how strong they have been, but that was pretty much the only thing done by a computer or a quantitative algorithm. What we try to do now is quantify as much of this as we can, so that we can make objective judgments. I think most people are still doing some kind of pattern recognition, but our emphasis in using technical analysis is to try to make it objective and quantitative.

J: Mr. Hayes?

TH: There has been an increasing use of computers, an increasing use of doing the kind of work we've done for a long time – using a computer to try to quantify tendencies. There has been more automation, and probably more recognition for the craft. Behavioral finance has a lot in common with technical analysis, with extremes of psychology being measured in both disciplines.

J: Mr. Davis, to what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

ND: We are almost 100 percent computer generated signals oriented. The advantage is that they are not subjective. They are objective measures. What I have found is that when people, including myself, deal with pattern recognition, they sort of see what they want to see. In other words, if you are looking at a historical chart and somebody says, 'well, that's a head and shoulders pattern which broke down,' and if you can see that, then, yes, it all looks pretty objective when you are looking at history. But it is different when you are living through it. I've see two people look at the same pattern and see totally different things. That's really my objection to the way technical analysis is practiced. I am a big believer in following the trend and having a stop loss, and about all you can do there is some sort of quantitative or technical way of doing things. But when you are looking at patterns, I still think people see what they want to see. So, what we've tried to do is get away from that, basically.

J: Mr. Hayes?

TH: We rely almost entirely on computer generated signals, so we obviously think that such an approach has an advantage. The disadvantage that you need to recognize is that

– I like to think that while the market does repeat itself, it never repeats itself in exactly the same way – you will run into extreme situations of outliers or those once-in-a-lifetime events, which are similar to the bubble of 2000, those types of events that will be hard for your indicators to pick up if they have not been tested over a period that has included such an event. So the disadvantage is that if you totally rely on it, you may have a change in the environment in such a way that you may run into a series of negative signals. Another example concerns the interest rates. Usually, a lot of indicators will tell you that once the interest rates drop, you should buy. They did that in the most recent cycle, however, most of the indicators turned out to be too early because the market did not respond. I think that's probably the disadvantage, that the environment can change and that the back-tested computer system will not pick that up necessarily.

J: Mr. Hayes, some technicians believe that it is still important to construct your own charts by hand. Do you agree?

TH: No, I don't agree with that. I don't really see the advantage of doing that.

5.5.5 The innovative process

J: Mr. Schuster, what drives your innovative process?

RS: I think that experience is a big factor. Curiosity starts the ball rolling, but if you are a beginner analyst and you don't have a lot of experience, you don't really know what the pitfalls are and you are just sort of shooting in the dark. I think that curiosity has to continue, but then you can apply some experience to the actual testing and to the actual process of evaluating indicators, methodologies, money management rules, or whatever you are going to apply it to. Over time, you learn the action of the market. That might be a little abstract to people who are not involved with it daily, but one of the things you have to understand from a technician's point of view is that we view the market as almost a living, breathing creature in a sense that it directly reflects crowd psychology, and there are certainly underlying economic principles involved with it. You know, earnings do matter, economic growth does matter, but from the technician's point of view, we are looking at prices that overshoot to extremes, or undershoot to extremes, and we are looking for that supply and demand, that human sentiment aspect and crowd psychology condition of the market. And I don't think people truly have an understanding of that, without having some solid experience behind them. It is also good to understand how the fundamental macroeconomic backdrop can also impact stock prices, and the fact that it doesn't always impact them the same way. So a lot of times you will have people talking about certain fundamental or valuation factors, and the simple fact is, because of certain conditions, these factors don't play as relevant of a role as they did in the past. Now, it could be that these factors come back to impact stocks in the next cycle, but experience allows you to at least gain a better understanding why things work and why things don't work.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

RS: I am always developing technical tools. I am always testing. I am always either trading ideas, or even validating and testing ideas that I read or see in the literature. It is amazing to me the amount of garbage that you can find out in the public. When you actually go test things over longer periods of time, you find that these ideas and hypotheses just don't hold up. So, you are always looking to improve, but by the same token I have also found that you don't really need to make it really complicated. You can stick to indicators or methodologies that you feel comfortable with, those that, one, you know have an edge (you've tested them and you know there is an edge there), and, two, fit your psychological makeup and make you feel comfortable. Oftentimes people just get things too complicated. In this process, I've certainly gravitate more toward a technical approach for shorter term, but sort of a merging of fundamentals and technicals for the more intermediate to longer term. And that's not to say that technicals can't work well for the intermediate or longer term. Again, it just comes back to my experience and my makeup. And I don't think a lot of people understand that when they aren't exposed to the market. You can't place a system or methodology onto somebody, even if it's a perfect system. As soon as you give it to somebody, it's now got a human involved, with human emotions, which might distort it. So, regardless of what methodology you use, you've got to be comfortable with it, and you've got to have some confidence in it.

J: So, is it just curiosity and a desire to improve, or were there really moments when you felt that classical patterns and indicators were insufficient, and that new technical tools were necessary?

RS: It's a combination of both of those factors. There is a curiosity factor, trying to see whether you can improve something by adding a fundamental component to it. Neither Ned Davis Research nor I really look at what would be considered "classical patterns," because we find that there is a lot of subjectivity to such an approach. However, I will say that over the last couple of years, with the improvements in computers and programming, there have been people who have been able to program these classical patterns. What is interesting, some of these patterns have been found to be highly effective. And one of the things that I haven't pursued yet, but that I do want to pursue, is to evaluate what these people have done and see for myself whether these classical patterns and setups which appear to produce excess returns going forward really have validity. In the past it has always been so subjective, and we don't like doing things that are subjective. We want the historical evidence, and that's why we've kept away from the so called classical patterns. It's not so much that these objective indicators have not been sufficient to make money, it's more of a case that you are learning, growing, evolving, and just testing new ideas.

J: To what extent do you share your inventions with other?

RS: We don't share a lot, and that's probably more because we are an institutional research firm, but we do publish, and we obviously publish for our clients. So, certain concepts are going to be very transparent to our clients, and we'll show them exactly what we are doing. If we are showing it to our clients, I can guarantee you it's going to get out there, because I found things that we've done in the Wall Street Journal two days later, and we did not give it to the Wall Street Journal, so, obviously, somebody passes it around. But some of the higher analysis that we do, we try to keep that internal, because there is an edge, and we don't really want to give away that edge.

J: What percentage of what you do, do you actually share?

RS: We are a very visual firm, which means we do a lot of charts and graphs. So, we are pretty transparent with that, since our product line is charts and not just verbage. Let's say we created a model which uses an overbought-oversold indicator, the trend, advance/decline line, and put-call ratios. We are pretty transparent that that's what we are using, but we would rarely give out the exact formula that we are using. So I would say the exact formula is on the lower end – it's given out maybe 5 percent of the time. I would say that the concept is given out 80 percent of the time. Now, my personal case is a little different, because I work directly with our institutional clients, so we develop models and indicators for them. We would never show anything that a client created. So, on the custom side, if we develop something specifically for a particular client, it's pretty much the case that 98 percent of the time we don't share that with anybody except for that client, unless that client gives us approval to do otherwise.

5.5.6 Emotional aspects of the craft

J: Mr. Schuster, has a big loss ever made you doubt the validity of technical analysis?

RS: No, absolutely not. What it does is it questions your discipline to follow what you are supposed to do. If I've encountered a big loss, then I've done something on a money management side that I need to examine. But it doesn't really change the actual methodology that much.

J: Mr. Davis, to what extent do your emotions interfere with your craft?

ND: Well, I think that's a big deal. People are emotionally committed to the market one way or the other, upside or downside, and therefore that influences what they see. Or, let's say, they are reading the patterns correctly, but they've had 3 or 4 losses in a row, so they see the same pattern again, and they really can't act on it. The computer doesn't care whether your last 3 or 4 trades were profitable or unprofitable, all it is interested in is at what point

something has been breached. So, the computer takes the emotions out. When we get a signal that something is changing to a different zone, we report it to the clients pretty much just as it happens. We are not picking and choosing, we are giving all the information, so there is really no or very little emotions involved in our work.

J: Have you always done it this way?

ND: No, I did it like everybody else. I started out trying to look at patterns, drawing trend lines, and counting waves, and I just found that it was unreliable and that I couldn't even trust my own ability to stop myself from throwing my own emotions and my own judgment in it. I realized that several people would be looking at the same thing and coming to different conclusions on it. I particularly don't like forecasting, because you get emotionally tied to your forecast. For example, you may have a pattern that breaks out, and it may be a profitable move, but you discard it just because it doesn't get to your target. Furthermore, you assume that any subsequent pattern that doesn't reach this target is wrong. I don't like that part of technical analysis.

J: When did you switch to the kind of automated analysis that you use today?

ND: I started in 1968 at one company, and then, when I started my own company and got computers and all, I decided to do it this other way. That was in 1980. So, I did 12 years pretty much judgmental, and then tried to make it more objective after that.

J: Mr. Schuster, to what extent do your emotions interfere with your craft? How has that changed since when you first started?

RS: I'll take the second part of that question first, because there has been a big change since when I first started. When you initially start investing, trading, and using technical analysis, oftentimes you are focused so much on the methodology and you ignore the emotional aspect and the discipline that's needed, and that usually causes you to lose money. But as you gain more experience and you realize that the money management is the absolute key, then you realize that you've got to take the emotion out of the trades. You put your stop-losses in, you lose a little money, you move on with life. So, the emotional aspect needs to be as close to zero as you can get it. Now, having said that, we are all human, and you know, you are never perfect, so it does creep in every now and then, at least for me. Maybe with the great traders it doesn't, so that's why they are great. But, the evolution here is probably an important part of this answer – I went from not having that emotional discipline, to improving vastly on that emotional discipline.

J: And you feel that that emotional discipline can be learned with experience?

RS: Yes, though a lot of it is not just experience, but the ability to defeat your own ego

– sometimes the experience doesn't help that.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[7]." To what extent is this statement true in your case?

RS: I think I sort of answered that in the last question. I think that's the key battle with investing successfully. You have to be able to defeat your emotions, and you've got to take the emotions out of the process. Your ego wants to get in there – you are making money, you want to double up because you've been successful so far – but you just have to stick to your plan. If you cannot stick to your plan, then that other side of yourself is winning, and, when that happens more often than not, you are going to end up losing money.

5.5.7 The role of creativity

J: Mr. Hayes, what role does creativity play in technical analysis?

TH: It has a definite role in terms of developing indicators, finding new ways of measuring the extremes in sentiment, and figuring out how this data actually reflects the market. So, yes, I think it does play a role.

J: But in the actual practice of technical analysis it does not play a role?

TH: I don't think it should play a role, because a creative interpretation to an indicator is hard to quantify. And, like I said, we try to use historical precedent in testing and interpreting the current message of a technical indicator.

J: Is there such a thing as "talent for technical analysis"?

TH: It's more something you learn, it's really more experience. There could be, I don't know, but I think it's more experience.

J: Is there a certain personality type that is suitable for a technician?

TH: You have to be open minded in that you have to be willing to let the market tell you what it's doing rather than the other way around. In other words, you would not be a good technical analyst if you believed that you could figure out what the market was going to do and expected the market to do that.

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[7]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

TH: I don't think so. We've done some work here with artificial neural networks and genetic algorithms. My response here is similar to the response I gave you earlier regarding the computer based systems – there will be times when you will need to override. I don't think we'll ever get to a point where the artificial intelligence will be able to take in enough information to be able to do that.

J: So even though you mostly rely on computer generated signals, still this human element comes in and plays an important role?

TH: I like to think of it this way. Suppose you are flying a jet plane and you are on an autopilot. There will be times when you run into some turbulence or a situation where you may need to take the controls manually. That does happen in certain environments. As I mentioned earlier, cycles do repeat themselves, but not in exactly the same way, and there will be once in a lifetime situations which have not been cycled through or tested in your data. You can only recognize these subjectively and then apply some type of adjustment to what your indicators are saying. Ninety-nine percent of the time, you want to follow your signals, but there are those cases where it would benefit you to have some type of subjective override.

J: So, in your practice you are constantly checking whether these signals that are generated by computer make sense?

TH: Yes, but it depends again on what types of indicators we are dealing with. Some indicators generate only a few signals a year, some will generate signals every day. But yes, you need to monitor your indicators and make sure that either structurally something has not changed that has made the indicator no longer as effective, or that the once in a lifetime event hasn't occurred. For instance, with certain types of data the indicators may be affected if the way business is conducted on Wall Street has changed. A number of indicators are based on specialist shorting activity. The specialists are currently under scrutiny, and if the specialist activity would stop, this would no longer be as relevant of an indicator. That's the type of thing that you need to be aware of – changes in a way trading is conducted that can affect sentiment indicators in particular.

5.5.8 Luck, astrology, etc.

J: Mr. Hayes, what is the role of luck in technical analysis?

TH: It's all the matter of probabilities in technical analysis. When you develop a back-tested indicator, there really is no indicator that will have a 100 percent record over an extended period of time in terms of its signals and at the same time produce a large gain.

If a particular signal has a historical record of 75 percent of being accurate, the odds are generally in your favor. So the luck is really whether at any given point in time that would prove to be the case or not. It's all a matter of probabilities to begin with, so you are going to have some good luck and some bad luck, but hopefully more good luck than bad luck.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

TH: No, I don't think so. I think what might undermine it is if it's used in a sloppy way, not in a thoroughly researched manner. I do believe that there has been good work done on how astrology can affect human psychology and create some patterns in terms of human behavior. That has been researched, though it certainly needs to be further researched. There have been studies done on how lunar patterns, for instance, affect human behavior. To the extent that everything that affects human behavior will have an effect on the stock market, the stock market really is simply a manifestation of the changes in behavior on a mass scale. So, to answer your question, I don't think it does undermine it.

J: Do you rely on astrology in your practice?

TH: No, we don't use it, but others do. The only reason we don't use it is that our approach is to try to quantify things, and it's one of those things that is difficult to quantify. So we don't use it.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

TH: I think there is a lot of validity to a lot of those theories. They are very interesting, and they do help us in terms of understanding whether we may be near an extreme in some sense or not. The only difficulty with them is that it becomes very hard to use them on a signal basis. In the case of Elliott Wave, for instance, wave counts are identified in hindsight, so it's very difficult to use it to generate trading signals. It's difficult to make money off of it, if that's effectively what you are trying to do. Although these theories do help you understand the markets, they can also be imprecise, and this gets to be a problem if you are trying to make decisions for trading and investment based upon them.

J: So would you say that these structures are valid descriptions of what underlies the market action?

TH: I can't speak for Gann, but I think there is validity in the work that has been done in the Elliott Wave area. The Elliott Wave has not only demonstrated the cyclicality that

underlies technical analysis, but also made it particularly interesting by showing that there are short and intermediate term within a longer term. So I think there definitely is validity to the structure, though the interpretation or the application of it would be difficult.

J: What exactly makes you believe that this is valid?

TH: It's been demonstrated that the market has been moving in these patterns historically. I don't really know the distinction between "scientifically proven" and "historically identified." People who study these theories go back and point out different cycles over time where lows and highs occur based on the postulates of the theories. The question is, will these principles hold true going forward. I guess you have to have faith in the repetition of historical tendencies, which basically underlies technical analysis, so therefore I think there probably is validity to it.

5.5.9 Level of conviction

J: Mr. Schuster, have you always been convinced about the validity of technical analysis?

RS: Yes, I have. Initially you can see too many people who use technical analysis and who are extraordinarily successful in the market place. There are a lot of fundamental people who are very successful in the market place. It's the matter of being successful at the discipline and the money management. In both cases you will find that successful traders, investors, or money managers are the ones who can really stick to their plan and execute the money management rules. The other things that I saw, (and this was more when I was in college), was that what I was being taught – the efficient market hypothesis and CAPM – in reality did not work. All this stuff made no sense to me, because when I looked at the assumptions and at what they were testing, I literarily decided it was a joke. I just thought, these people do not live in a real world. It sort of did a disservice in my mind to fundamentals, because it completely turned me off of the fundamentals. But I've evolved a little bit there, so now I can see some value in the fundamentals.

Furthermore, I noticed that fundamental analysis would allow you to buy a stock which would just keep going down, down, and down. Well, that did not make any sense to me. If a stock is going down, let it go down. I know this is the game of sentiment and crowd psychology, so when it goes down, it tends to overshoot on the down side. So why would you buy it when it's going down, rather than at least wait till you see some proof that it has started up again? If you find a stock that's at the bottom and that's starting to creep up, and that also has good fundamentals, then I can understand buying that. But buying something just because it's undervalued doesn't make any sense.

J: Did you become more or less convinced since when you first started?

RS: I've actually become more convinced for shorter term trading. Shorter term trading is a direct reflection of crowd psychology. But I do know that earnings and economic growth matter, and that fundamentals have some value when applied appropriately, so I take a much less technical approach with longer term investing – I blend it a lot more there.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

RS: No, it didn't. If anything it actually encouraged me, because I saw how they were testing this. Even as an undergraduate – and I am not as smart as these people who taught me – I saw the lack of validity that they were giving to technical analysis. Then I saw how they were actually testing their hypotheses, and I strongly disagreed with some of the assumptions that they were using in the testing of both the technical and the fundamental sides. So it was actually the exact reverse for me.

J: Could you give me some examples of things turned you off and that made you realize that the academics were not doing the right thing?

RS: Well, a lot of times the testing would be done on a regression basis, and regression automatically assumes normal distribution. We know for a fact that market does not have normal distribution, so my question was always, well, why would you test it this way. And there was never really any good answer. Now, I've read some papers that took nonlinear approaches to testing the market, but that has occurred more in the last 10 years and not so much back in the 80's when I was in school. So they violated the assumptions of the linear regression right off the bat. Then you got into CAPM. Everybody knew the assumptions just did not hold up – there is no perfect market portfolio, you don't have a risk free rate, there are taxes in this world. You can't give me this list of assumptions and say, if all of this is true, then here is what happens, when none of it's true. I just thought it was a really huge leap in faith to have your foundational theory in finance based on something that just isn't true in the real world.

J: What, in your opinion, is the best proof of the validity of technical analysis?

RS: Making money – that's the best proof in any of the disciplines of investing. And I do want to be clear, there are people who make money with fundamental analysis, so it's not that I think that it does not work for some people. But those for whom it does work have a very good, disciplined plan which they execute effectively. So the bottom line on either side of this divide is the question: are you making money? That's the world we live in, but that's not the world in which the academics live – that's one of the key differences.

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

RS: No, because I learned early that the management of the investment process is far more important than anything else and that there are a lot of things that contradict each other. So the fact that one person said this while another person said that did not really impact me early in my career. Later in my career, I basically relied upon my own testing. For example, I would read things in the newspaper that would just catch my eye, and I would think: 'I can't really believe that's true.' Then when I would actually test them, I would find out that they are not true. That happens all the time.

J: Mr. Davis, does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

ND: Yes, that's exactly my point that it does bother me. Some people say technical analysis is an art. Well, if five people who are standing on an art exhibit and looking at the same picture all see something else in that picture, would you have any confidence that you could read the next art painting? So, it bothers me that there no hard and fast rules, and that's why we try to impose hard and fast rules in our analysis. For example, the breadth thrust can be measured in a very objective way by considering the number of new lows below one percent. If you can take that back 40-50 years and if you can show that the history of the signal has been pretty consistently profitable, then you have some proven theories. This doesn't work for individual stocks, but for the overall market there is a number of technical indicators that we think have hard and fast rules or are proven.

J: Mr. Schuster?

RS: No, and I say that with a little bit of grain of salt, because in the way we do technical analysis, there are hard and fast rules. We put parameters and rules on the data, so we get around that problem. However, this is harder to do for some of the more classical technical analysis disciplines, such as chart reading, because there you don't have any hard and fast parameters that you can test. Now, having said that, I should mention that nowadays you actually have people who can quantify these chart patterns and use the computer to test them. Whether their quantification of the chart pattern definitions is right or not is debatable, but at least they are putting rules and parameters on the chart patterns – I think that's a step forward.

J: So the fact that in technical analysis there are no hard and fast rules and no proven does not bother you, because you are able to counteract that by imposing the rules?

RS: That's right.

J: Mr. Davis, do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

ND: I sent you one chart of the data that I have done recently. Breadth analysis and technical analysis look at, basically, if there is a move, how many stocks or industries are following the move. What we found in technical analysis is that the more different industries and the more stocks follow a particular move, the healthier and the stronger that move is. We have done numerous tests and this has proven to be a very successful type of analysis. Then we went to the economy and we looked at the industrial production. We asked how many of the 250 or so industries that the Fed follows have production that is higher than what it was 6 months earlier. What we found is that when industrial production is rising on a lot of industries, when, say, 60 percent or more is rising, then the economy is much stronger. In the middle zone, between, say, 47 and 60 percent, the economy just does so-so or normal. When it's very low, when very few industries are rising, the economy does very poorly. We took the exact same analysis that we did for the stock market – the breadth analysis or the diffusion index as they call it in economics – and we applied it to the bond market, the economy, and so on and so forth. So I think the kind of indicators we are talking about, the kind of indicators that we have used in technical analysis of the stock market rather than individual stocks, works pretty much across the board.

J: So, it works for all markets?

ND: Right, any free market, basically.

J: I am also curious as to what extent would these indicators work when applied to the data that has nothing to do with the markets, like the weather data, for example?

ND: They would work on any kind of market data, but on the data that has nothing to do with the market, I don't know. I would say the economy has very little to do with the market, though the industrial production is a market measurement. So, I don't think that it would work with weather, but I am not sure.

J: Mr. Schuster?

RS: I think that technical analysis would work with any data that has a human emotion element in it. Technical analysis, at least the way we do it, is an indication of supply, demand, and crowd psychology. If crowd psychology is involved with it, if human beings can move the data that you are talking about, technical analysis would work for that; for example, when you get into an extreme bubble mode, technical indicators would be able to detect that you are at a dangerous level. So, if there is human element in the data, then I do believe that technical analysis can be applied to that data.

J: So, technical analysis would not work when applied to, say, the weather data?

RS: You have to be careful. Let's say you deal with that data and we were to test it

with technical indicators, and we might actually find something that works. You have to be careful that you are not just fitting the data, there has got to be some rhyme and reason of why certain things might work. Now, you may find certain data that you wouldn't think would work technically, but when you actually look at it, you might actually find that there are big extremes, there are big drops, it gets sort of overdone on one side, and then it comes back up on the other side. It's not that it couldn't work, but you have to use your head and you have to have an intuitive reason about why it works. You can't just throw numbers at it and say that it works.

5.5.10 Lifestyle

J: Mr. Hayes, are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

TH: The way be use technical analysis makes life less stressful, because you are not in the dark as to what is happening. You understand the market better, and when you understand something, the situation tends to be less stressful. In other words, the less you understand why the markets are doing what they are doing, the more stressful it becomes, because you have less control over your exposure to whatever the market may be doing. I would say that technical analysis reduces stress because I don't have to worry if the market is doing something on a shorter term basis if I know what the longer term trend is doing. On the other hand, if the market is moving into a bear market, the indicator will have gotten us out, so therefore we wouldn't have to be stressed out about a decline. If you have good indicators that are reliable, that should make your life less stressful.

J: How many hours do you spend practicing technical analysis?

TH: Well, that's kind of tricky – I guess you first need to define what "practicing technical analysis" really means. It's not like you sit down and draw trend lines or anything like that. It's more of a matter of working with the data and other information that you have at hand, and interpreting that information, and that may not always be strictly technical analysis. With that in mind, I would say that one third to one half of my day is related in some way to technical analysis.

J: Could you describe your working day?

TH: You've interviewed Ned and Robert and they do somewhat different things than I do. My role here is to write publications, do research, look at the charts, look at the data, work with the data, come to conclusions and make recommendations, and work on developing indicators and models. Basically those are all the things that I do – I start with charts and indicators, develop models and interpret them, and then communicate my conclusions via publications.

J: Would you say that technical analysis is always on your mind, even when you are on vacation?

TH: You are always interested in what the markets are doing, but it's probably a bigger overriding thought for those who do a lot of short term trading which I personally don't do. (I know Robert does more of it than I do.) I tend to be more longer term, so I don't worry too much about the day-to-day volatility.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[8].

Would you agree with de la Vega? To what extent does your trading control your life?

TH: The people who are controlled to such an extent are the short term traders, because their livelihoods really depend on making a profit on a transaction that they are involved in. That's not what we do here – we are more of a research firm.

5.5.11 Advice

J: Mr. Davis, what advice would you give to technical analysis students? What is the key to success?

ND: The main thing I would tell technicians is to try to find a way to make the rules and the pattern recognition more objective. You should be able to test your rules over long periods of time and across different markets. Most people think that they have a good grasp on reality, without realizing that there is a difference between their perception of what is happening and what is actually happening. Let me give you an analogy. Oftentimes when you are sitting in the crowd of one team at a basketball game, the referees will make certain calls against your team, and everybody in your crowd will start to boo because they want to see something else. And they will swear when they leave the gym that the referees were terrible, and that they favored the other team. This will go on time and time again, in every single episode. So, even your perception, what you see with your own eyes, is what you want to see. Once you come to the realization that reality is the way you see it, rather than the way it actually is, you realize that you can't practice technical analysis based on your own

[8]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

perceptions and that you can't read a chart like an artist would do – it just won't work. I have seen a lot of what I call the artistic technicians – they will do well for a period of time, but I have never see any of them who can consistently, over a long period of time, do well with pattern recognition. I am also a proponent of the theory of technical analysis – I am a big believer in trend following, cutting you losses short, letting your profits run, this sort of thing. But, when you start talking about artistic interpretations, you really are on a slippery slope. So, my advice would be to go about technical analysis very objectively, the way we went with it, to impose hard and fast rules which can be tested over long periods time – I think that's a better way to go.

J: What kind of formal education is most compatible with the profession of technical analysis?

ND: First you would want to learn what technical analysis is all about, and then you would need to be very strong in quantitative analysis as well as in computers, (or at least have someone with these skills working for you). It's difficult, but an individual would need to have skills in all three areas (technical analysis, quantitative analysis, and computer programming) to be able to be a successful technicial.

5.6 An Interview with Walter Deemer

5.6.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

WD: I first got interested in technical analysis when I was in college. I went to Penn State. I was on the main campus of Penn State in 1961, 1962, and 1963. There was only one brokerage office in town and two out of three people there were very much into technical analysis. One of them was also a part-time teacher at the university. In 1962 the stock market crashed. It was something that was easily predictable using technical analysis, and I was impressed by the fact that they were able to predict it. I would say that they essentially bent the twig for me, and from then on the tree was inclined towards technical analysis. So I first started charting indicators in 1962 when I was still an undergraduate at Penn State.

J: Did you have a mentor? What was his or her role in your development as a technical analyst?

WD: My mentor was a guy who worked at the brokerage office named Dick Williams, who is now deceased. At Penn State I was in the honors business administration course, and essentially in your senior year there they let you work on the topic of your choice on your own for 3 or 6 credits, I forget which. The topic that I chose was technical indicators vs. leading economic indicators, and Dick helped me chose the technical indicators, use the parameters and research them. We compared a whole bunch of technical indicators, including Lowry's buying power and selling pressure, with a whole bunch of leading economic indicators. So he helped me chose the technical indicators and the parameters to use, and guided me in my research.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

WD: On my own. I talked with Dick Williams and other people, but essentially it was reading books. I was lucky. They did not teach technical analysis in school, and still to this day very largely do not teach technical analysis in schools, but I was lucky because I sort of made them teach me technical analysis as much as I could. But, though I learned as much as I could from other people, essentially it was mostly from the books. As the matter of fact, the first book I read was Joseph Granville's book. I'll never forget, I had just started to get interested in technical analysis, and I took it out of the library at Penn State over the weekend. There was a bunch of us, and we were carpooling home back to Philadelphia. And when we were carpooling home I was reading the book and the trip went by so quickly, because I was just fascinated by the book. It was there that Jo Granville went into technical indicators – this was before his On Balance Volume. He was very much into technical indicators, and after reading that book I started plotting things like the advance-decline line,

an overbought-oversold oscillator, the odd-lot indexes, and so forth. I had a statistical book that I kept back in 1962 on technical indicators.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your trading?

WD: Unfortunately not enough. I started using it with real money when I started to work at Merrill Lynch, but technical analysis is the type of thing that you never stop learning. I've been doing it from 1962, for 42 years, and I am still learning.

J: Which mistake did you learn the most from?

WD: It's hard to say which particular mistake. Technical analysis is not infallible. As Stan Berge once said, we are dealing with probabilities rather than certainties. It's sometimes difficult to realize that, no matter how strong you think the probabilities are, in a given situation they are still probabilities, and not certainties.

5.6.2 Personal style

J: Could you describe your own distinct style of technical analysis?

WD: In a word it would be anticipatory analysis. When I went to work for Putnam in 1970, in one of my very early days, I remember telling one of the big fund managers that IBM had just broken out. He said: 'Fine, but I can't buy it. It's already broken out and moving, the price is rallying, I can't really buy it in size. So what I need you to do is tell me before it breaks out.' So I went back to my room and spent quite and bit of time working on that, but I soon found out that that, when you are dealing with major institutions, managing large sums of money, you need to tell them that the only time they can really buy in quantity is during the decline, and the only time they can really sell in quantity is in a rally. So, what I need to do is tell them just before the market makes a top, or just before a stock makes a top. Or, when the market is going down, I have to tell them just before the market makes a bottom, so they can buy that last supply and sit there with a basket and have everybody throw stocks in it. Once it starts back up it is much more difficult for people to buy in major sizes. So where a lot of technicians can say, 'well, as soon as the rally is over and it starts back down, I will get out,' I don't have that luxury. Or they say what you do is you keep tightening up your stop in a long position. Well, you can't sell two million shares on a stop on a floor of the New York Stock Exchange, you just can't handle it that way. So what I need to do is look at things that give me an idea that trend is starting to reverse rather than waiting for it to actually reverse. So I am much different from a lot of my colleagues, because of the fact that I've been dealing only with institutional investors for 34 years.

J: How much of what you learn from others do you directly apply in your analysis?

WD: I would say, in all honestly, practically everything I use is from others. I build on it. Information comes from various places, and I've been lucky enough to be with some very smart people, like, for example, Dean LeBarron, who is one of the real investment geniuses. He is the fellow who started index funds. He is so contrary that when index funds became popular, he got out of the index fund business. One day Dean and I were talking, and Fidelity had just come out with some of their sector funds. These sector funds are very small, narrowly focused mutual funds, that invest only in a single sector of the market, such as energy services, precious metals, networking, electronics, or semiconductors. There are really 42 of them, and they price these things hourly. They are designed for very aggressive traders, and they are run by fidelity analysts, who follow a particular industry. So Dean and I were talking about what this might mean, and Dean said I think there is some information in there, somewhere. And I went back, and I though about it. I realized that what Dean was telling me was that rather than following industry groupings that someone like Standard and Poor's puts out, Fidelity funds give you a chance to follow actively managed portfolios. These are the best perceived bio-technology stocks vs. the best perceived precious metals stocks vs. the best perceived electronics stocks. You are measuring the best of each group at any particular time. So, back in 1986, we started doing relative strength work on the Fidelity sector funds – we've done a lot with it, and it's been very helpful. But the original idea was not mine. I picked up the ball and ran with it, if you want to put it that way. The idea came from Dean LeBarron, and I was smart enough to be at the right place at the right time and listen to him.

J: How do you learn what works for you and what does not, without making big loses?

WD: The only way, I think, to learn is to make mistakes. And what you have to do is try not to make the same mistake twice. I would like to think that at my age I have made all the mistakes possible, but unfortunately I haven't. It's all supposed to work, it never always does, so you learn from the mistakes.

J: Is your analysis more effective when you are working by yourself or when you are working with others? Also, in general, is technical analysis better done working individually or in teams?

WD: In my opinion, it's done better individually, because technical analysis is part contrary – you are leaning against the prevailing wind all the time. So, in coming up with the ideas, you are really standing on your own, it's your own experience. Basically, what I am selling clients is the experience. I've been following this for forty years. I've seen it all, I've done it all. I've made a lot of mistakes, hopefully learned from them, so when the market does something, I know how to react, because it's something that's happened sometime before. So really it's experience. And they don't want somebody else's experience, they want

mine. If they want somebody else's experience, they'll work with that somebody else, and that somebody else and I should not sit down and try to come to a common ground because that's probably not going to be as accurate as the individual opinion.

J: In what kind of market conditions do you make most mistakes?

WD: All-encompassing. I am not a trader, so I am not trading the markets. What I am trying to do is catch trend-reversals. Remember that my job is to anticipate the trend reversing, and the general mistake is anticipating it too early. It was obvious in late 1999 that the technology bubble was going through a once-in-a-lifetime topping process, but it took longer to play out, and, more importantly, it carried prices much further than logic would dictate.

J: How much of what you do are you willing to share with others?

WD: I think probably all of it. I have no secrets. We had a presenter in our brainstorming session at a conference in Orlando this past weekend, who had a market timing service for mutual funds. He had all the signals, but he did not tell us what was behind them. We learned nothing from him. If I go to a client and say, 'I have an indicator that says you should sell stocks,' unless they know what the indicator is, the rational and the logic behind it, and how it fits in with other indicators, they are not going to act on it. So, unless I share with them not only what the indicator is, but why logically it means something, they are not going to be able to pay any attention to it.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

WD: Interpretation.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

WD: You see, if I am dealing with the longer term, I don't get as much random noise. Random noise is more generated on a very short term basis, on a day-to-day or an intraday basis. What I am doing essentially is stepping back – I let the trading desk at the institution worry about the noise, and I worry more about the longer term trends.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

WD: Combined with fundamental analysis.

J: Is that what you do?

WD: No. What I do is supply technical analysis, and then the client integrates it with fundamental analysis, the interest rate analysis, political analysis, and all sorts of other factors, and combines everything to make the best decision. So my position is that, from a long term standpoint, integrating technical analysis correctly with everything else is the most important thing that an institution has to do in order to realize what it can do, and, more importantly, what it cannot do. Technical analysis does have limitations. For example, no matter what the technical position in the market is right now, if the Federal Reserve comes out and says, 'speculative activity is too high, we are going to dampen speculative activity, and our actions are going to cause pain and suffering as we take them,' the market will ultimately respond to it. And that did happen in the midst of the speculative binge of the late 1960's, when William McChesney Martin said there was going to be pain and suffering. At the Manhattan Fund where I worked, we were sort of smirking at the fact that this guy was going to close our game down. Well, he did, and all of the charts that were in the uptrends ultimately became downtrends.

J: How much of your technical analysis is done on an intuitive and subconscious level?

WD: Quite a bit, but then you try to back it up with facts. Again, it's the experience of having been there so many times. What you are trying to do is first grasp the precedents, and then relate the current experience to the precedent. So the intuitiveness, perhaps, is trying to figure out what part of the precedent is most applicable in a current situation, and then the analysis is trying to back it up with some numbers.

5.6.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

WD: Hard question, because what we do, as was described by my boss at Putnam at one time, is we use exception analysis. You follow a whole bunch of indicators, a whole bunch of factors, and if they are within normal parameters you kind of ignore them, but when they go to one extreme or the other, you start paying attention to them. Usually, when an indicator goes to an extreme, it's trying to tell you something. Having said that, I should also mention that a lot of the indicators that have been reliable in the past are no longer reliable because of the changing market conditions and the changing market framework. The best single indicator statistically used to be member firm short sales as the percentage of total short sales, but, because of arbitrage activities and other changes, that no longer works. Whatever parameters used to work first changed and then became meaningless. Unfortunately, I have a whole bunch of indicators in that camp that used to work real well and that don't work any more, and I don't have a whole lot of indicators that work real well as a result of all the changes. We are still working.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

WD: I don't really know.

J: Is the number of indicators you follow greater when you are more cautious than when you are less cautious?

WD: I follow all the indicators all the time, and for the ones that I don't follow personally, I rely on other technicians to bring them to my attention. Again, I am looking for the exceptions, so when somebody brings out that a certain indicator, which I may not necessarily follow, has gone to an extreme, I start wondering what's going on. So the number of indicators that I follow really depends on the indicators themselves, on how many of them are signaling something at a given time, rather than on market conditions.

5.6.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

WD: Well, in many ways. One important change, from a practitioner's standpoint, is that the formation of the Market Technicians Association in its early and middle years fostered sharing of information. In the old days people would come to you with an indicator but they wouldn't tell you what it was – it was proprietary. Then you heard the terms 'proprietary indicator' or 'my work' all the time, which, again, didn't help. If I went to MIT with the perfect indicator, but I only gave you the signals without telling you what it was, it wouldn't help you a whole lot. If I went to MIT and told you what was behind it, then you could take it apart and find out whether it was just random luck or something more. The MTA encouraged the sharing of information, so technical analysis is a lot more open now that it was when I first came into the business. The other thing, obviously, is the information age. When I first started in business on my own in 1980, my main data source was a VCR hooked to a television set that recorded the stock market channel. I don't need to do that any more, because now, with the Internet, all the information is available for free and instantaneously. The amount of information that's available is just incredible, and that's something else that has changed.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions?

WD: I do my best.

J: Do you study the new inventions just to know what others might be doing, or do you also update your own strategies as the field evolves?

WD: I update my own strategies. I am always trying to get the best feel for the market no matter what tools I can use. Let me go back to what I was saying earlier about Fidelity. At the very beginning, when they first introduced their sector funds, Fidelity had 30 some sector funds. They charged you a 2 percent fee to come into the funds, as well as 1 percent redemption fee, which is no longer legal. Someone at Fidelity described their sector fund portfolios as a big casino. They said, 'like a big casino, we don't care what game you play as long as you are in the casino.' It cost you 2 percent to come into the casino, the typical management fees that you are paying while you are at the casino are higher than in the non-sector funds, and then, when you leave the casino, there is a 1 percent exit fee. So if somebody wanted to take a break from playing the sector funds, if they wanted to move into cash, they had to move into the sector money market fund or pay a fee to leave the casino and a fee to come back into the casino. That was the only way. So, by following the assets in the sector fund money market as a percent of total select assets, you could get a feel of how fully invested these aggressive players were. The sector fund cash ratio was a true contrary indicator – the lower the cash ratio, the more bearish it was, the higher the cash ratio, the more bullish it was. They eventually dropped the redemption fee, they were forced to. And to make a very long story very short, the sector fund cash ratio really doesn't work that well any more, because there is no way to measure just how much sideline cash there is, because it's partly all over many other market funds as well. In its day, it was a wonderful indicator.

Now comes along an outfit called Rydex. Rydex has a whole bunch of mutual funds, many of which are indexed to the market, and some of which are indexed inversely to the market. So Rydex has an index fund that moves with the S&P500 and an index fund that moves inversely to the S&P500. And Rydex is nice enough to report the assets in each of their funds at about midnight every night. So by comparing the change is assets with the change in the net asset value you can find out how much money came into and went out of those funds every single day. That's very different from the opinion polls or sentiment – with Rydex you are looking at what people are actually doing with their money, rather than what people think about the market. As it turns out, I am convinced that these 6 or 7 billion dollars of assets in Rydex reflect the general hedge fund trading activity which is the driving force in the market. So this is something that in the last two years we've been doing a lot of work with, getting these numbers every single day from Rydex, figuring out what the flows are, and trying to find out how best to measure them. This is one new indicator that's come along to replace the many that have fallen by the wayside. So we are always looking, but usually, it's kind of tough. There is so much arbitrage going on in the market now, it's very difficult to find out where a short sale is just hedging something and where it's a reflection of somebody thinking that the market is about to crash.

J: To what extent has the introduction of the variety of computer software aided the craft?

WD: It helps you draw charts. We used to draw charts by hand, but now we draw them by computer. It saves us a lot of time calculating, and it saves us a lot of time drawing charts.

J: To what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

WD: We don't rely on computer generated signals, we just look at indicators. There is no magic-type thing. Computers just provide a much easier way to follow and test the data. Now, fortunately, people like you at MIT are doing a lot more on crunching numbers than we are, so if there are truths out there, you will probably find them sooner than we will. Hopefully, you'll share them with us. Again, I don't trade, so that's probably not applicable to me. We don't have a buy signal today and a sell signal tomorrow, or anything like that. It's all subjective analysis, rather than objective analysis. If I say I think that the Nasdaq is vulnerable to a decline, I don't have some red light that's going to go off at the precise moment when it starts declining, or something like that.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

WD: I think you get more information that way because you are forced to look at it. The problem is that it takes so much time to follow. If you do a chart of each of the S&P500 and each of the Nasdaq100 stocks by hand, that's 600 daily charts. If you can do one in every 10 seconds, that's 6 a minute, so if you're lucky, it's going to take you a 100 minutes to do that. So you've taken almost 2 hours to do this, before you've even started doing any other work. On the other hand, when the computer draws the charts, you can go through and review them much more quickly. You can also set up parameters of things you are looking for and have the computer flag them, for example.

J: So, do you still do it sometimes?

WD: I do it a little bit, but I am lazy, I let the computer do it for me.

5.6.5 The innovative process

J: What drives your innovative process?

WD: What drives my innovative process? Fear of being wrong and losing all my clients, greed in trying to be more accurate in the market, and a desire to hone my skills. Somebody once asked me why I didn't manage any money, and I said, 'well, that's a whole different set of skills than market forecasting, and when I perfect my skills in market forecasting, I'll try another field, but I am still perfecting my skills in market analysis.'

J: Do you and to what extent collaborate with others during the innovative process?

WD: I work mostly on my own. I ask for other people's help when I am looking for data, for example. In some cases when I have tentative conclusions I'll share them with some people. But, basically, if it's something I am developing, I know more about what's going on with the particular indicator or whatever it is that I am developing, so it's usually best to work on my own.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

WD: All the time, because as somebody once said, whenever you think you've got a key to Wall Street, somebody comes along and changes the lock. So, whatever indicators work, however well, however long, something will come along to change them, and you always have to be alert for new things to do.

J: How soon after you develop a particular technical tool do you make it accessible to public?

WD: Well, when I think it works, I will make it accessible to my clients right away. Again, my job is to give them tools. Most of them are interested in what I think the indicators are saying rather than seeing the indicators themselves. So what we do is publish the reasoning behind our market opinion – we have all the indicators to back it up, but rather than publishing these indicators, we furnish them on request.

J: Are there tools that you developed but never shared with the rest of the world?

WD: No.

J: How often do you use the technical tools you developed?

WD: Constantly, perpetually.

5.6.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

WD: How did I feel when I first lost a lot of money? MIT really wants to know how people feel when they lose money? We are not masochist, we did not feel good, we felt that our gods had failed us. And how do we feel when we still lose money? We still feel bad, especially as we get older, because we don't have as many chances to make it back as we did

before. Sometimes you get a little more conservative. You show me somebody who is happy about losing money and we'll send them over to Harvard.

J: Has a big loss ever made you doubt the validity of technical analysis?

WD: Sometimes, but mostly it's the interpretation. The problem with technical analysis is that you can always build a very bullish case and you can always build a very bearish case – and here I am talking long term, though I suppose it could be the case for trading too. There are people right now who have a very bullish case and some very good reasons behind it, and there are people who have a bearish case and some reasons behind it. There are always some indicators that are frightfully bullish, of which we heard at the conference in Orlando this past weekend from different people and different disciplines, and there are some indicators that are very bearish. So. the problem is, which ones do you listen to? When you are wrong, there are always those indicators that did work, and that's the humbling part of the business. You see, technicians don't seasonally adjust things; we don't revise data or something, the price is the ultimate arbiter. If you are a weather forecaster and it gets colder, you can sort of fudge away that some factors changed, but in the stock market, if it goes down more than you thought, it went down more than you thought, period. And there are always reasons, beforehand and afterwards, to explain why it did what it did, but you were listening to something else.

J: To what extent do your emotions interfere with your craft?

WD: Emotions always interfere, that's part of the problem. The reason I don't trade is because I get too emotional. If I start trading something like stock index futures, I end up looking at every trade on them. I get upset every tick that goes against me, and I get excited every tick that goes for me. Some people are just not emotionally suited to do it. That's why I've chosen to be a long term market analyst – I get too emotional over the short term fluctuations, so I ignore them.

J: Has this changed since when you first started?

WD: No, it's probably the same.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

WD: I think it can be learned, but it's very difficult to do it. Mike Epstein has been able to do it over the years, and I admire him for being able to do it. I could not do what he does.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that

astonished observers see a human being fighting himself[9]*." To what extent is this statement true in your case?*

WD: This goes back to the fact that there are always a bullish case and a bearish case which can be made. Especially when the market is going against the case you are making, sometimes it can be awfully tempting to listen to the opposing view. So there is always the conflict between the forces of good and evil. And the evil ones are always tugging at you, because they are always out there. I mean, whenever you play this tape back you can call me up and I'll give you someone who is very bullish and someone who is very bearish, and I'll give you the case for each side. I don't know whether you are going to be bullish or bearish, but somebody is going to be exactly agreeing with your view, and somebody is going to say that your view is totally wrong. And they'll both be compelling. So there is always that tug of war.

5.6.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

WD: It plays a great role, and I don't think it can really be learned. I mean, I don't think Rembrandt learned to be creative. I think maybe he learned to enhance his creativity, but he was really one of those geniuses who are born with it.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

WD: I think so. Some people just seem to have a knack of choosing the right case rather than a wrong case, of knowing what to look at. I think the psychological element has also something to do with it, the fact that you have to be unemotional especially if you are a trader. Also, a technician is usually a contrarian, because the market usually goes against the crowd. People are most bullish generally at the top, and most bearish at the bottom. So you have to be bullish when people are bearish, and you have to be bearish when people are bullish. I am not just talking about the masses that are walking down the street, I am talking about the money managers too, because they are people too, so you have to be a very strongwilled person to stand up to these people and say, 'precisely because everybody in America says that things look bad, you should be buying stocks.'

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

WD: I think so, but I think it may be more a psychological training that an educational training.

[9]De la Vega, Joseph. Confusion de Confusiones. Harvard University Printing Office. Massachusetts: 1959. p. 22.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

WD: No. Maybe on a very short term basis, but the problem with the stock market is that it is the result of an infinite number of factors or variables, with an infinitely varying number of weightings on them. Someday the market will be excited about something that's going on concerning Washington's foreign policy, another day it might not be interested at all. There are all sorts of variables, and the artificial intelligence model first has to be big enough to encompass every single variable including, let's say, astrology. If any single person ever buys or sells a single share of stock based on something astrological, then astrology is, by definition, a market factor. So you have to put than in your artificial intelligence model. Now you've got this long, infinite list of variables in your model, and you have to figure out what weights they have – some days astrology may have tremendous weight, other days fear may have tremendous weight. It's just an infinitely varying degree of weights. I think human brain can probably cope with this a little better than artificial models.

Having said that, I am sure some day somebody at MIT will play this back and laugh at it, because you will have it. When I first came into the business and Jerry Tsai had started the Manhattan Fund, the rumor about Wall Street was 'Jerry Tsai is buying, Jerry Tsai is selling, and that's what's making the market go up, and that's what's making the market go down.' And the one thing I realized when Mike was explaining some of the research that you all are doing is that some day it's going to be 'MIT is buying, MIT is selling – they've got the computers that know it all.'

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

WD: It's an art, because, if I understand your question, you are going back to my point about the coexistence of the bullish argument and the bearish argument. The science is developing the argument, the art is deciding which argument to embrace, and that's the tough thing.

5.6.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

WD: It shouldn't be much of a role, should it? But it always seems to be, doesn't it? And maybe even your artificial intelligence model will have a little luck in it. In other words, sometimes it may get the market right because of luck, rather than thanks to all the variables and weights you put in.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

WD: Yes, it does, because technical analysis basically is looking at the market internals. What I am doing as a technical analyst is analyzing the price of a stock. My fundamental colleagues are analyzing the value of a stock, which really depends on the value of a company. And the problem is that, as an investor, you are not buying the company, you are buying a little piece of paper that represents part ownership of the company. The value of that little piece of paper goes up and down for all sorts of reasons, not all of which have to do with what the company is doing. Sometimes the value of the little piece of paper will go up and down because a fund manager has a hangover and decides to do some selling of a bunch of stocks and this is one of them, and that has nothing to do with the fundamentals. What technical analysts are doing is analyzing the price of that little piece of paper, and, in aggregate, we are analyzing the stock market rather than the economy.

There are many things that play a role in that analysis, for example, money supply, because money makes the world go around and causes the stock prices to go up and down. Foreign policy would also play a role because it would influence some people's buy and sell decisions. One thing that as a technical analyst you're doing is trying to measure the impact that the stimulus has on the market, and trying to quantify the unquantifiable. In a bear market, no amount of good news will make the market go up, and in a bull market, hardly any amount of bearish news will make the market go down. So if you have something bearish happen and the market ignores it, you know it's a bull market, and so forth. Astrology tries to put a cause and effect on something that really cannot be related as the causal and the effective. Linking astrology to the stock market, saying that by observing something in the heavens you can automatically infer what is going on in the stock market, is, I think, a mistake.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

WD: I don't use any of the foregoing. I wish that my colleagues didn't use them a lot either. I've just never used them, they've never worked for me, and I've never learned enough to try to make them work for me. Call me an old fuddy daddy if you wish, but I can't get them to work. I think Elliott Wave is wonderful in hindsight, but I am living today and now and not in hindsight. When you get a 10 page paper, the first 5 pages of which gives you an Elliott wave count, and the last 5 pages of which give you an alternate wave count, that doesn't really help much.

J: Do you believe that these structures underlie the market action, that they are the governing principles?

WD: The governing principles? I don't think so. I think there are long term generational cycles – you go through a bust boom cycle over a period of a generation. And then you have shorter term cycles. For example, a presidential cycle is well documented as having an effect. I find it fascinating that there was a four year cycle in Great Britain, which does not do presidential elections every four years, and that the cycle existed before the British and the US economies were linked nearly as closely as they are today. So I think there are some long term psychological cycles, but I am not sure that they are quantifiable enough to be useful except in a very broad sense. For example, according to the Kondratieff cycle there is supposed to be a horrible decline every 50 or 60 years. Some people say that it is somewhere ahead of us. Some people say that the Kondratieff cycle did indeed occur and that it was in Japan rather than the United States this time, that is, that the Japanese stock market and the economy went through a true Kondratieff bust cycle. So, there is some long term evidence, but whether that's an underlying structure that explains everything in the market is another question. I guess nobody has proven it to my satisfaction yet. There is too much irrationality to make it that rational.

5.6.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

WD: Yes.

J: Did you become more or less convinced since when you first started?

WD: I've become more convinced, because it's the basic underlying truth of the stock market. As I said earlier, the only thing that analyzes the stock or the stock market is technical analysis, everything else is really peripheral. When Cisco was at 80, there were some people who thought it was drastically overpriced, and some people who thought it was the greatest growth stock of all time and that it was still cheap. You can come up with the value, but the underlying truth is the law of supply and demand, which is technical analysis. If I were working for Warren Buffet and buying companies, I would have a different perspective on life, but I am working for people who buy these little pieces of paper and so I use technical analysis. If you want to follow and forecast the stock market, you have to use technical analysis. Everything else is just peripheral.

J: Were always equally convinced?

WD: More respectful of it over the years.

J: Which special moments of your career have been critical in determining your level of confidence and conviction in technical analysis?

WD: I can't really think of one.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

WD: No, because technical analysts are contrarians. We are used to being told that we are wrong about the market. Most people don't agree with us about the market. Back when I worked at Putnam, I used to give weekly presentations and I used to tell the story that if, after I made my very forceful and very insightful presentation to a room filled with money managers saying that the market was going to go up, the fund managers all stoop up, applauded, hoisted me upon their shoulders and carried me down the hallway yelling 'Hosanna, Hosanna,' then dumped me as they rushed into the trading room with their buy tickets, I would go back into my office knowing that I had done something wrong. It was when they did not generally agree with me that I knew I was right. That's the theory of contrary opinion. So, the fact that academics don't agree with technical analysis makes me think that they haven't looked at technical analysis in the right way, understanding that there are some terrific limitations as to what technical analysis can and cannot do. And yet, if the academics are looking to forecast financial markets, then they need to analyze financial markets and the things that impact them, and that's where technical analysis comes in. With all due respect to the academics, the fact that they don't accept it simply means that they don't understand it then.

J: What, in your opinion, is the best proof of the validity of technical analysis?

WD: That I am not in debtor's row, that I am not standing on the street corner begging for food – just the fact that it works. I know some people want track records. The problem is, when your analysis is long term in nature, it gets difficult sometimes to do track records. Let's say the market is coming into a bottom and I think that my clients should be turning more bullish. I can't turn an out and out bear into an out and out bull overnight. Nobody can. What I can do, if I am lucky and if I do my job properly, is turn that person into a little bit less of a bear and then, the next week or the next month, into a little bit less of a bear still; in other words, I am working at the margin. Unfortunately, if I really do my job well, the money manager will think that it's their idea rather than mine. So trying to get a track record is difficult.

Remember that the money manager or the institutional investor is getting inputs from a whole variety of sources – fundamental, economic, monetary – and I am just one input. So what I have to do is work against other inputs as well in trying to convince him that my interpretation is correct. And if I do it well, what I am doing is sending that money manager back to his other sources to question their bearishness and ask them, for example, 'Do you think that this may be already priced into the market? Since the market has gone down, do you think that the economy is now bad?' Well, that would mean that the stock market didn't go down in vain. The stock market went down, the economy is bad, that's

the way it's supposed to work. The stock market is the leading economic indicator, so now the stock market should turn back up before the economy. You are not going to get the good economic news at the bottom. You won't get them until six months into the uptrend, you'll have to anticipate them, and so you'll have to let your clients know that they cannot be bearish because the economy looks bad. The problem is that translating this into a track record gets very difficult.

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

WD: Well, I wouldn't say contradicted. I would say that some indicators that are presented as fullproof are not fullproof. No indicator works all the time, no indicator gives constant information as John Bollinger once said. And the other thing is, there are some things that are presented in books which I either don't understand or can't make work, such as the Elliott Wave. There are a lot of books on the Elliott Wave, and all I know is that I can't make it work to forecast. I suppose I could make it work if I wanted to explain something that's happened, but that's not my job. My job is to predict, not explain what's happened.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

WD: No, it's wonderful. It's part of the wonderful, fascinating field of technical analysis. There are no rules. Nothing works all the time. But there are no rules in a lot of things where we think there are anyway. It goes back to what I was saying earlier – when you think you found a key to the market, somebody changes the lock. There are no rules. These are all probabilities, not certainties.

J: Do you believe that technical analysis works even when applied to data other than the market action data (e.g. the weather data or the river flow data)? Please explain.

WD: The answer is yes. Technical analysis is measuring trends, momentum, whether the trend is gaining or loosing strength. Somebody once told me that a skilled physicist would make an excellent technician because the market action really can be explained by following the laws of the swing of a pendulum. What you are measuring in the stock market is the whole sum of human laws focused at the corner of Broad and Wall Street. All the supply and all the demand come down to the price of the stock market as measured by the S&P500 average or whatever you want. This price measures all the human irrationality, including the fact that somebody may be buying the stock because they've spent 5 weeks studying all the stocks and this is the one they've come up with, and the fact that somebody may be selling the stock because little Johnny had an appendix out and needs the money. We know what the S&P is right now, so we have a starting point. So what we are trying to

do is measure the trend, the direction in which it is going, how forcefully it's going in that direction, whether that direction is changing and how rapidly it's changing, whether that change is increasing or decreasing, that is, the rate of change or the derivative.

The same can be true of the weather systems. I happen to track the hurricanes the same way that I track the stock market, because, number one, a hurricane is a big physical force, and, number two, a hurricane is going in a particular direction at any particular time, it can either be accelerating or decelerating, and it can either be changing direction or staying in the same direction. If it's changing direction, it can either be changing direction at an increasing or a decreasing rate of change. So you can try to forecast this by charting a hurricane on a map, just as you would chart a stock or a stock market on a piece of paper. And, remember, the only reason you are doing this is because, as the Chinese proverb would say, a picture is worth a thousand words. Well, a chart is worth a thousand numbers. It's easier for the human mind to grasp a chart than it is to grasp masses of data. By plotting a hurricane on a map and charting it, you can get a fairly good idea about whether it's changing direction or not. Similarly, you can plot various river states and other things related to the flow of a river. As a matter of fact, as we were talking last night, I thought that some of the things you were doing and measuring in electrical engineering had applicability to financial markets and financial management.

J: Is it true that these patterns and indicators capture something that's specific to and fundamental of the financial markets so that when they would be applied to data other than the market action data (for example the weather data, the river flow data, etc.), they simply wouldn't work?

WD: I don't think it's true. Let's say MIT has got their artificial intelligence model for the stock market, and now they want to do one on weather systems. That's the same thing. They've got models on the internet of weather systems, they've got weather maps 10 days out projected with precipitation, wind speed, and everything like that, and the important thing is, there are changes in trends. Now, the five best models – they run these weather models every 12 hours – never agree with each other. So to be a good weather forecaster, you should not be forecasting only based on the 10-day or the 240-hour model. You should compare the 240-hour model with the 228-hour one, which will have a slightly different set of parameters, and take the changes. Then you should take the changes every 12 hours from now on as you are coming into the actual event, and you'll come up with a pretty good forecast. You'll come up with a pretty good forecast not by looking at the forecast map which is set in stone, but my monitoring the change in the forecast map from the forecast map 12 hours ago and to the one 12 hours in the future. You'll find the trends. And a trend is a trend, be it in the atmosphere or be it in the financial markets. As long as you are dealing with broadly based forces, and both atmosphere and financial markets are broadly based forces, things are not going to change form black to white overnight. So I think there is great deal of application for technical analysis. Similarly, mathematicians have been applying mathematics from other fields to financial markets with some success, and teaching

those of us in the financial markets a thing or two in the process.

J: Could you apply patterns such as head-and-shoulders, inverse head-and-shoulders, rectangles, triangles, etc. to data other than the market action data to detect trend reversal or continuation?

WD: Sure. I am a radio ham, and the radio propagation depends greatly on the sunspot cycle and the amount of sunspot activity. There are charts of sunspot activity over the 11 year cycle, and in order to find a peak and the projected high in the sunspot activity, they are using, in essence, technical analysis. And I think you can do it with all sorts of things. My friend Dean LeBarron is very heavily involved with the Santa Fe Institute, which is very much mathematically oriented, and they are trying to integrate mathematics from other fields into the stock market. It's something that I don't understand, but I am in awe of what is being done.

5.6.10 Lifestyle

J: Could you describe your working day?

WD: The first thing I do for my clients in the morning is send them a daily update. It's sort of like a daily weather forecast for them. You don't necessarily run your life on a daily weather forecast, but it's nice to know whether it's going to be warm or cool, and whether it's going to be wet or dry. You are still going to go to work the same way you always go to work, but you may decide to take an umbrella or a coat, depending on what the weather forecast is. And, my job is to give them a very quick, if you will, weather forecast. Also, if there may be a question on their mind, my job is to answer it before they ask it, so that they don't have to call me at 9 o'clock. In the old days the stock market opened at 10, so I used to issue my daily update about 10 minutes of 10. The stock market now opens earlier, and we are now almost 24/7 in the financial markets. To make a very long story very short, the daily update goes out now at 20 minutes to 7 in the morning. So I get up at 20 minutes to 6 and go into the office. I get those Rydex numbers that we've talked about a while back. They come out at midnight, so I get them first thing in the morning. Then I look at the overnight trading to see what's happened, and issue my daily update.

So, my day starts about 20 minutes to 6. The really nice part of my life is that I so love what I do that I don't set an alarm clock. I always wake up at 20 minutes to 6 without an alarm clock. The stock market is such a fun thing to analyze, because every morning I come into the office downstaires thinking that I know what I am going to see, but it never turns out exactly that way, there is always some wrinkle or something that's happened. After I send out my daily update, I collect statistics, I do the regular things of running the business, and then I start collecting the closing statistics, which come out starting with the closing of the bond market at 3 o'clock. I keep a number of broad sector averages which we started at Putnam in the early 70's. We actually had some sector averages at the Manhattan Fund in

the 60's, so I've been following the market sectors for a long while. We followed currencies and the bond market at Putnam in the 1970's, so we were doing intermarket analysis before some of the people who popularized it were even born, I think. After collecting the closing statistics, we issue a rough draft of the daily update, sometime around 6 or 6:30 at night, because there are some people in Tokyo who want sort of an idea of what's going on as their market opens.

Usually I go to bed early. I've had three detached retinas, and my eyes get very tired very quickly, so after looking at television and computer screens all day, my eyes get tired, so I go to bed early and rest my eyes for a while. And then, once every two weeks, I publish a sort of an in-depth report, which takes the better part of three days to prepare. Wednesdays, Thursdays, and Fridays of every other I am doing that. During the day it's just answering emails and answering any client questions which I didn't anticipate in my daily update. So, I am in the office at 20 to 6 in the morning and at 8 o'clock in the night, but every once in a while I go out and get a breadth of fresh air.

J: How many hours each day do you spend practicing your craft?

WD: Whenever I am awake, because I am always thinking about it. That's all I do. I don't manage money, I don't do anything else. I am just trying to figure out what the stock market is going to do. And so it's really every waking hour.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

WD: There is always stress because, number one, you are dealing with probabilities, not certainties, which means you are never always going to be right, and, number two, I anticipate moves, rather than react to them. The market is always going to go against me, hopefully, but most of the time it goes against me more than I think it's going to do before it reverses, if indeed it reverses at all. So there is always a certain amount of stress. The other thing is, we don't have a big corporation. I can't blame the committee down the hall for coming up with a bum forecast. It's always me, so there is always stress. Now, why I can handle this kind of stress and not the emotion of trading the market, I don't know. I have to go talk to a shrink to find out.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[10].

[10]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts:

Would you agree with de la Vega? To what extent does your trading control your life?

WD: I love what I do. You'd have to ask my wife to get the best answer perhaps to that. She once asked me a couple of years ago: 'Are you thinking of retiring, shouldn't we be thinking about retiring like normal people and everything?' And I said, 'Why would I want to retire, I am having so much fun with what I am doing!' I enjoy what I am doing. When I go on vacation and I flip on the stock market it's not because I have to, it's because I want to. When I follow these indicators, it's not because I have to, it's because I want to. I am curious as to what's going to happen, what's the next act in this never ending play. It's the most fascinating story, why would I want to do anything else? Everything influences the stock market to some degree, so whenever I am looking at anything, doing anything, it really has something to do with the stock market. So why do I need something else? It's fun. And I enjoy it. It's not work. If I thought it was work, I'd do something different or I'd retire, but this is fun.

5.6.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

WD: Experience. Experience is the best teacher. Whatever experience you can get in the academia, get it. But, as I said, I was very lucky at Penn State. We had in the early 1960's an IBM 70 or 74, which, I was told, was one of the five biggest computers in the country – it was doing Department of Defense work and things like that. Because I was in the honors program, I was allowed to program that thing. I actually punched out programs and data on the punch cards. I was allowed to do that, so I was getting a little bit into computers in the 1960's. At the same time, I was getting a little bit into technical analysis, because I wanted to. I created my own curriculum if you will.

Ulitmatelly, experience is the best teacher, the only way you can learn. Somebody can show you something, but you've got to find out yourself that that's not going to work all the time. I've seen the wheel go around and into the mud, and come back out again. You've got to live through it a couple of times to realize that things at the bottom really, really, really do look ugly. You can't get an idea out of a book how ugly it can be at the bottom. And you can't get an idea out of a book how euphoric it can be at the top. And you can't get an idea out of a book how to realize that when things really look ugly and everything is screaming at you logically that this is not the time to buy, you should go in and buy. And when everything is giddy and euphoric, that's the time to sell – so you sell and go to a party, and people are telling you how much money they've made and everything, and you can't really tell them you just did some selling because it was probably a good idea.

1959. p. 22.

J: What advice would you give to technical analysis students? What is the key to success?

WD: Experience, openmindedness, realizing that the market is bigger than you are, realizing that no matter how smart you think you are, the market is going to make you look like an idiot every once in a while, and realizing that it's all the matter of probabilities. I mean, in baseball, if you've got 4 out of 10 right, you could be a national champion, but in the stock market 4 out of 10 right is not very good.

5.7 An Interview with Paul Desmond

5.7.1 The early days

J: When did you first get interested in technical analysis?

PD: I guess I got interested in technical analysis before I knew what technical analysis was. Through my father, I just kind of bumped into point and figure charting. He taught me how to read point and figure charts and how to plot them. We got to the point where we kept 500 point and figure charts every day, but I wasn't really aware of the distinction between technical analysis and fundamental analysis. Then, in 1964, I was doing some research in the Miami library, and I bumped into the Lowry material, and was very fascinated by it. I tried to talk to the owner or somebody else who worked there, and I got very caught up in the analysis that they were doing, and wanted to be a part of it. I actually offered to work for them for nothing, just so I could learn from LM Lowry. So that was my start.

J: So he was the one who actually inspired you?

PD: Very much so. I had gone to school and majored in banking and finance. I really wanted to major in the stock market, but there were very few courses on the stock market, and all of the courses that I did take were oriented towards fundamental analysis and very long term investing (just buy and hold). I always felt that there had to be some place where you could get a master's degree in technical analysis, in how to make money in the stock market. When I met Mr. Lowry, I though this was my professor and this is where I wanted to come to learn how to make money in the stock market.

J: He was also your mentor?

PD: Oh, very much so.

J: What was his role in your development as a technical analyst?

PD: He was a philosopher as well as a technical analyst. He related the study of the stock market to everyday life. For example, he would always say that women make better technical analysts than men do, because all women are inclined to buy things when they are on sale, whereas men are inclined to just buy things on a whim. If men see something they like, they buy it without even asking how much it is. On the other hand, women are always focused on how many times it has been marked down before they buy it, and that's the right way to operate in the stock market. You always want to buy below the average price, when the bargains exist, and sell when the prices are high. That helped me understand the importance of the analysis that we were conducting, because it made common sense. You see an awful lot of people who use technical analysis, but they don't really understand what they are using or why they are using it. A lot of times people cannot tell you what the

certain measurements that they are using are composed of or what they are supposed to be measuring. I think that's simply because they have never gotten below the surface. In particular, they have never thoroughly studied the law of supply and demand, how it applies to the stock market, and how it is the foundation of all macroeconomic analysis, including the stock market. This common sense education in the importance of the supply and demand was extremely useful to me. Mr. Lowry was a big influence on me in terms of how to think about the market. He always said that the market tells the story, not the analyst. Analysts need to step back and let the stock market tell the story, and then report on that, rather than look for the evidence to support the claim that they have already created. That was an important part of the educational process.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

PD: A little bit of both. I had taken a lot of economics courses in college, and I had been pretty much aware of the law of supply and demand in college. Chapter one of almost any college level economics textbook that you pick up is always about the law of supply and demand, saying that the law of supply and demand is the starting point, the foundation of all macroeconomic analysis. And then, for some reason, it stops there, nobody ever goes any further. If chapter one says that supply and demand constitute the foundation of technical analysis, then chapter two ought to discuss what indicators one can use to measure them. It is frustrating to know that it is the foundation, but not to know how to use it, measure it, or take the next step. Mr. Lowry was very helpful from that standpoint, because that's how he started out. He started out working for a bank in Miami. This was in the early 30's, still in the range of the 1929 to 1932 crash. He was a young man, and he thought that he was going to learn a great deal from the bank officers, the older men that were there. But, instead of learning from them, he found that they spent most of their time during the day wandering up and down the hallways and saying: 'Well, nobody can blame us, we bought good quality stocks. We don't understand what's happening here, these are good quality issues, but they just keep going down.' He realized that these educated, trained, experienced analysts really had no idea about how to deal with the forces of the stock market. There was something more than just buying good quality stocks and hanging on for the long term, there was some other element missing. So Lowry got frustrated and quit the bank. Deciding to try to figure out what was the missing element, he went back to the college textbooks. Everywhere he looked, there was the law of supply and demand, and yet, there was no explanation as to how to measure supply and demand. So he decided to figure out how to measure them and create some measurements. He concluded that all of the forces of supply and demand are related in four numbers. First of all, there is price. There are two parts to the price equation: one, the number of stocks rising, which is captured by the advance-decline line, and, two, the dollars gained by all of the advancing stocks, which is captured by points gained, an indicator that Mr. Lowry created. And then he looked at the amount of volume traded on stocks that were advancing, which is called upside volume. He was the man who first broke down the total volume into the upside volume and the downside volume. So, for stocks advancing,

they had the number of stocks advancing, the amount by which they were advancing, and the amount of volume that accompanied those advances. Similarly, for stocks declining, they had the number of stocks declining, the amount by which they were declining, and the amount of volume that accompanied those losses. And no matter what you are trying to measure, it could be real estate, gold, silver, soy beans, stocks, or bonds, supply and demand is all you have. You could measure sentiment, you could take surveys of people, but what people say and what they do are very often entirely different things. Mr. Lowry actually wanted to see them put their money on the line, before taking them seriously. The advance-decline line was already in existence, but he created points gained and points lost indicators, and upside and downside volume numbers. Starting from there, over the years we have developed a series of indicators that use those six numbers to measure the pressures of supply and demand in force. I learned all of that from him, and carried on with it since then.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your trading?

PD: I am still working on that. The learning process never stops. Supply and demand are only the means to measure the more important part of technical analysis, which is recognizing that price changes are the result of human psychology. Understanding human psychology is something that goes on forever. Nobody really fully understands it. You have some small ideas of how it may work, but it is a never ending process. When I first started learning about technical analysis in depth, I thought that I found the answer, the holy grail. I thought that I could do no wrong, and that I would never have a loss again. I think everybody starts out that way. It's part of the learning process to go through that. I started managing other people's money at a very young age. I convinced a number of my college buddies that we should all put money into a pool, and for several years we did very, very well. I think we more than tripled out money over the first couple of years, but that just got me to go further out on the limb, to be more susceptible to making mistakes. I really thought that there was no need to think about losses occurring. So when we ran into a rally in a basic downtrend market, I thought it was a new bull market, and we lost a substantial amount of money. That was an important part of the learning process. It taught me to keep my ego out of the picture, not to try to determine what the market is going to do, but to let the market tell me what it is going to do, show me the direction in which it is trying to move. Losing that money was probably the most important lesson of all. Until investors go through the baptism of fire, they probably don't know very much at all. I have talked to a lot of young people since then who say that they have never taken a loss in the stock market. I say to them, you haven't been baptized yet. You are going to do it, and the more you think it's not going to happen, the more it's going to happen.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

PD: There is a big difference between theory and reality. That shows up in a number of ways. For example, over time, as you meet people involved in various areas of investment, you start to notice distinct differences in their personalities. There are analysts, there are traders, and there are portfolio managers. To be successful at any one of these three disciplines requires personality traits that are substantially different from those required to be successful at the other two. Traders make decisions very quickly. They don't stop to think about what they are doing very much, they just act. They have to have that ability in their nature. If a trader sees a situation that looks good to him, he'll act on it and buy, and then, if he realizes he was wrong, he reverses himself very quickly. He does not have an ego. He controls his ego to the point where it does not bother him to take loses, he knows it's a normal part of his method of operation. A very successful trader may find that as much as 60 percent of his trades are losses, but as long as he adheres to the rule of cutting the losses quickly and letting the profits run, he knows that he is going to be successful. An analyst, on the other hand, is a completely different creature. I am an analyst. I tend to think about things to a fault. I'll study things, look at the probabilities, and so on and so forth, and by the time I finish thinking about it, a lot of opportunities are gone. But I could not be a trader no matter what I did. I am a long term investor, not only because I think that's the best way to operate, but also because that's the only way I could survive. My personality won't allow me to be successful at being the trader. I am forced to be a long term investor, because it takes me a long time to make a decision. But, when I make a decision, I've cut down the odds of being wrong substantially, but at the same time I've missed opportunities. So, recognizing the differences in personalities that are required to be successful in a certain way in the stock market is very important. A lot of people start with the idea that they can trade quickly and make a whole lot of money, and that they can keep doubling and tripling their money repeatedly, and be enormously successful. A very few of them can. There are very few trader personalities in the world. It really takes an incredible amount of discipline and a different kind of personality. That's something that I have never seen in any book. I often thought if I was going to write a book on the stock market, the first four or five chapters would be on psychology. You need to know yourself, you need to know your personality, you need to know what risk you are willing to take, how quickly you can make decisions, how difficult it is for you to accept making mistakes, how quickly can you change your mind. A lot of people get a thought in their mind that they are just not willing to change. These things are critically important to being a successful investor. If you don't know that, nothing else matters. The charts and the measurements don't mean a thing unless you know how to put that information to work.

J: Which mistake did you learn the most from?

PD: You tend to learn more from your mistakes than you do from your successes. I have made my biggest and most embarrassing mistake in managing this money for my friends, who all thought that I could do no wrong. Also I was convinced that I could do no wrong. So, we've decided that we were going to go for the gold, but lost a substantial amount of our

money. That was a very important lesson for me. It taught me that you should not manage money for your friends, because there is too much emotion involved in it. To be a successful investor, you need to be very cold blooded about it. You need to keep the emotions out of everything that you do, stick to the information coming from the market, and try not to get your ego involved. You just have to be very disciplined. That was probably the most significant lesson I've learned. But, every day you go through the process of learning something else that you shouldn't have done. I think life in general is to a large extent a process of elimination. You just keep going through the process of making mistakes, but over time you learn to eliminate many of them and hopefully quit making the same mistakes over and over again. The same process moves you towards being a better investor.

5.7.2 Personal style

J: Could you describe your own distinct style of technical analysis?

PD: Everything we do is based on the law of supply and demand. One of the interesting things that I've noticed is that too many technical analysts do not really recognize how pervasive supply and demand are. Supply and demand really are the foundation of all technical analysis. Almost everything that's considered technical analysis is nothing more than the form of measuring supply and demand. All you are trying to do with the chart patterns is determine whether there is more buying or selling going on, or whether there is more money going into stocks than flowing out of stocks, and all of that is basic supply-demand analysis. We are at the center of that supply-demand process. A lot of people think of what we do here at Lowry's as being unique in that we concentrate on supply and demand. In a lot of cases they do not realize that what they are doing is also supply and demand, just in a different way. We simply measure the flow of money into and out of the markets, and the changes in investor psychology that are reflected in those flows of money. That's the only thing we do here.

J: How much of what you learn from others do you directly apply in your trading?

PD: I've learned a lot from LM Lowry. Every once in a while you find some tidbit of knowledge coming from another source. But, for me, the main source of learning is the market. The market is constantly showing you where it wants to go, but the question is whether you can understand what the market is trying to tell you. That takes a great deal of studying. We have a history that goes back 70 years. We are now entering our 71st year. We use that history as a table of probabilities, almost like an insurance company's table of probabilities. We can go back in history and say, we've have X number of cases like this in the past, and the outcome has generally been such and such. That's the major learning process that I go though. You are always searching for new and better ways to read and interpret what the market is trying to tell you. But I have totally committed myself to that side of the process of analysis. I purposely go out of my way not to read too much of what

other people write. I don't read the Wall Street Journal. I generally try to stay away from other people's opinions, because I don't know how they arrive at those opinions. I don't know if they are just saying, I think this ought to be, or whether they are using good solid statistics. And, the more I respect somebody's opinion, the more I am likely to rely on what they say. I feel that it's more accurate to let the market tell me what it's feeling, rather than what some individual human being is feeling. We all have a difficult time keeping the ego out of our analysis, and that's what leads everyone astray.

J: How do you learn what works for you and what does not, without making big loses?

PD: The starting point for investors is to understand themselves. They have to understand their risk tolerances, and so on. If they do that early on, then they automatically fall in line with the type of investing that's available to them. If they have trader's personality, that is, they make quick decisions, they don't like to think about things too much, they like to move, they like action, they don't have much of an ego, they don't mind reversing themselves when they are wrong, then they'll automatically gravitate towards being a trader, because the kind of thing I do is too dull, too boring for them. But if they find that trading is too exciting, that they don't like that much activity, that much decision making and decision reversing, then they tend to gravitate toward being a longer term investor. I've seen a lot of very good analysts who attempt to manage money. The minute there is actual money involved, they simply cannot function properly. They just have a hard time controlling their emotions. I don't think somebody should get involved in the stock market in any way, before they go through that kind of psychological profiling, of determining who they are and how they are going to react to the pressures that the stock market is going to throw at them.

J: Is your analysis more effective when you are working by yourself or when you are working with others? In general, is technical analysis better done working individually or in teams?

PD: I think there is probably an advantage to teams, but you have to pick your teammates carefully. What you are trying to get at is an absolutely objective, disciplined, controlled, and factual analysis. The reality is, we are all human beings, and we are all heavily influenced by our emotions. No matter how hard you try and no matter how cold blooded you think you are being about the analysis, you are still a human being, and it is still easy to get off on a tangent and say, I think a see a certain pattern here, when you really don't. So, if can have a few people around you who are likeminded, and who are trying to get at the same thing that you are trying to get at, and you can bounce ideas off of each other, and correct each other, you can probably end up a little bit closer to remaining on that narrow objective trail. There are several people here in our office that I depend on quite a bit, if nothing else, to confirm that I am not allowing my emotions to influence the analysis. It's very difficult to operate completely in a vacuum. It's good to have other people to talk to, to confirm that you are doing things on an unbiased basis.

J: Are there certain market conditions in which you tend to make more mistakes than in others?

PD: Absolutely. If you take a long term chart of the Dow Jones Industrials or of the S&P500, you can see changes in patterns. You will see periods in which the market averages are in clear strong trends, either up or down, usually up. Once these long trends end, the market goes into a choppy pattern. The reason for this is that an uptrend typically starts at a low price, rises to a high price, at which point a lot of investors start to feel that prices and valuations are too high, and they can't get excited about buying stocks at these levels. So you go through a choppy period where investors can't really make up their mind as to whether or not to commit. A lot of investors try to take profits at these levels and that holds the market down. Then you go through another long, clear, well-defined trend, usually on the downside. After that you sometimes go through a basing pattern for a period of time, where the prices are low and move sideways. Unless you are a very short term trader, you are going to make a lot of mistakes during these sideways periods. You are going to think that the market is going into an uptrend again when it is not. You'll have to turn around and get back out again. The market keeps doing this to you, it whips on you. A number of analysts spend a considerable amount of time trying to develop indicators that will tell you when the market is in the trading mode and when it is in the trending mode. The distinction between the trading and the trending mode is clearly visible when you look at the long term chart of stock prices. During a strong uptrend, it's hard to do anything wrong, and during these choppy periods, it's hard to do anything right. You either have to endure it, keep making little mistakes and correcting yourself very quickly, or find a way of identifying the trading mode and stay out of it.

J: How much of what you do are you willing to share with others?

PD: We share almost everything. The important thing for a technical analyst is to share the meaning behind the indicators. A lot of people closely watch an indicator, but if you ask them what is this indicator composed of and what is it measuring, they'll say, I don't know, but it shows me when I should buy and when I should sell. I think that's really frightening. You have to understand what is it that you are doing, if you are going to be successful in the long term. So, we are very open about the philosophy and the thought process that goes into studying and measuring supply and demand and understanding what each factor really represents. We have a few indicators that, for commercial reasons, are considered to be proprietary. More precisely, the formula for putting the indicators together is proprietary, but the components are not proprietary, we tell people what's in it. It's almost like the Coca-Cola formula – they tell you exactly what's in there, they just don't tell you how they cook it. But everything else that we do is wide open. We show in our reports upside and downside volume for the market every day, points gained, points lost, as well as all the other basic market statistics. We make available to our subscribers the history of our analysis

going all the way back to 1933, so that they can go back, look at our work, and determine whether we are being objective or not. I think that's an important part too, it helps keep us in line.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your success?

PD: Part of it would be objectivity. It's relatively unusual to find real objectivity in the stock market. The stock market seems to attract egos. A lot of people will have some theory that guides their analysis, and many times they will put this theory in front of reality. There are some popular theories around. One of them is the Elliott Wave theory, which says that there are certain waves that take place in the stock market, and that's generally true. It's true about as much as saying there are generally seasons to the year, but if you try to get too specific about the seasons in a year, then you can make some bad mistakes. And people tend to get too specific about these theories, like the Elliott Wave, and they say, it doesn't matter what the market is doing, this is what it is going to do. That's really dangerous. What they are saying is that their theory is right, and the market is wrong. The market is always right. So the fact that we don't have any built in biases partly account for our success. We simply believe that if there is more money going into the market than there is coming out, prices will rise, and vice versa. Moreover, we have increasingly recognized that the market is much more complex than it previously has been or has been thought to be, and I think that this recognition is a big part of the future of technical analysis. Bull and bear markets are all mixed up inside each other. For example, during the bear market from 2000 to 2002, there was also a bull market going on at the same time. The bear market was primarily in technology stocks, and the bull market was in mid cap and small cap stocks. And if you did not know that, you would have missed an incredible opportunity. While the vast majority of investors were losing money, you could have been invested in mid caps and small caps and making a substantial amount of money. I think that has existed all the way back through history to one extent or another on a regular basis, and we are working on going back and identifying those phases in the past where bull and bear markets existed simultaneously. What we are moving towards is segmenting the market in pieces, so that we can see those trends within trends. I think it makes an enormous difference. Just in this uptrend, from the March 2003 bottom over the last 10 months the heavily weighted big cap stocks have gone up about 15 percent, while the mid cap and small cap stocks have gone up conservatively 35 percent. So simply knowing where to position your money, rather than just treating it as *the* stock market, even in an uptrend you could have doubled the standard benchmark, which is the S&P500. The same thing is true for the 2000-2002 bear market: while the technology stocks were collapsing, other stocks were making huge gains. That's where we are concentrating our attention in the years ahead. So all of those things help you make better investment decisions all the time.

J: How do you deal with the problem of tradeoff between early signal detection and sensi-

tivity to random noise?

PD: The way short term traders deal with it is by being willing and able to reverse themselves quickly. Some of the best traders I know will tell you that you have to be prepared to move just on the noise, because some of the best gains will come from the least likely situations. They will also tell you that you should not wait for the ideal situation, because the ideal situations many times do not work out as well as the questionable ones. On the contrast, a big part of what longer term traders go through is the process of trying to filter out the noise. You have to get rid of the noise. You have to wait until you can make that differentiation, or you don't act. So here we have two dramatically different approaches. On one hand a short trader is saying, I am going to act on the noise, because who knows? On the other hand a longer term investor is saying, I am simply not going to act if I think there is noise until I have a clearer picture, and therefore I have to be in a situation that would allow for substantial market advance from that point on. If the evidence suggests that there is going to be a limited advance, I can't act in those cases, I have to sit on the sidelines and wait a better opportunity. This is a demonstration of how the short term traders and the long term investors, or positioners, as I prefer to call them, have to operate entirely differently, and to a large extent cannot understand each other because of that. Again, you have to know who you are and what you are. I could not operate on a short term basis if my life depended on it. I would not have much money left very quickly. Similarly, there are a lot of successful short term traders that could not be long term investors either.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

PD: I think that's a personal decision. I prefer to operate in a totally technical area, because I feel I am more comfortable with that, but that's just my personal preference. Generally, most investors in the world come up, through their education, from a fundamental standpoint. Most colleges teach fundamentals. I don't know what happens after chapter one. Chapter one is about supply and demand, and then, all of a sudden, chapter two is about corporate earnings, economic developments, and all the other fundamental factors. I don't know why that is, I just don't understand it. It's easier for most investors to say, even if I am going to use technical analysis, I like to have it with fundamental background about the stock. Statistics will bear out that an investor is probably better off if he finds a stock that has good fundamental grounding, good earnings, good value, and is also under accumulation. The problem that most fundamentalists have is that they will identify a stock with good earnings and good value, but, for some unaccountable reason, nobody will be interested in it, there will just be no buyers there. So they'll buy such a stock, and they'll just sit there for long periods of time waiting for it to go up, but it won't go up, and it may even go down, despite the fact that it has good fundamental background. And they will get frustrated. The key is, stocks go up and down not because of earnings directly, but indirectly. Earning and fundamental factors do not control or dictate to investors, but they

influence them, some times more than other times. There will be times when investors aren't influenced by fundamentals at all, so that the market will go down even with good fundamentals, or won't go up with good fundamentals. But, most of the time, if a stock has good fundamentals, the buyers tend to show up. So it's easier to buy good fundamental stocks backed up by good technical action as well. We have done a number of studies in the past that show that a combination of fundamental and technical produces the best results over the longer term. I personally prefer to operate entirely on technical factors. There are some parts to fundamental analysis that cannot be applied to certain investment vehicles. For example, it's pretty hard to apply fundamentals to exchange traded funds, to mutual funds, or to derivatives. You just can't look at an option or something like that and effectively apply fundamentals to it. I prefer to just operate purely on technical indicators, because fundamental analysis is an influence on stocks, but it does not control them. The law of supply and demand controls stocks: if there is more money flowing in than coming out of stocks, prices will rise. And it is not saying that maybe they will rise, it is saying that they will rise. If the company has good earnings, you can not say with certainty that the price of its stock will rise, all you can say is that there is a strong likelihood that the price will rise. So I prefer to use supply and demand because it controls the price movement, rather than just influencing it.

J: How much of your technical analysis is done on an intuitive and subconscious level?

PD: As little as possible, I hope. There are two parts to the process. One is the indicators or the numbers themselves, which are generated by the computer, and all of that is absolutely objective. Then you have to take all that information and do something with it. You either have to write a report for other people to use, or you have to manage a portfolio, or you have to make trades, you have to take action. And that's where the subconscious comes in, that's where you have to apply those rules of behavior that we were talking about before: knowing how to remain disciplined, how to keep your ego out of the picture as much as you possibly can, how to be objective, how to avoid getting caught up in the traps that all investors get caught up in when they try to decide whether we are in a bull or a bear market before they look at evidence. All of that becomes subconscious over time, and you get to the point where you have little red flags popping up in your head when you find yourself going off on a tangent that you shouldn't be going off on. That's something that I have developed over time. I can really see a red flag pop up in front of me, which tells me I am getting angry, excited, or emotional.

J: Is it possible to have an intuitive feel for a trend? Is there a distinction between an intuitive understanding of a trend and an understanding reached by observing an indicator?

PD: Sure. In all walks of life experience is an extremely valuable ally. Some mechanics can listen to the noise of a car and know exactly what the problem is. Some people can smell the air and they know whether it is going to rain or not. That's not intuition as much

as it is experience coming into play. It's simply saying, I've seen this before. For example, if on a warm day here in Florida all of a sudden you feel a very cool breeze come across, you know it's going to rain. That's just something that I've learned after living in Florida for a long time. When some people see a dog on the street, they immediately know whether or not that dog is going to be friendly. All of that is not intuition, as much as it is experience. In the long run, the experience is much more important, or at least it is equally important as the book knowledge. I don't think that ought to be called intuition. Intuition suggests that you just know something, for which there may be no good reason. That's a dangerous thing in a stock market. You better know why you are thinking what you do.

5.7.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

PD: For example, what short term traders would like to do is recognize the evidence of the approaching change in trend before that change actually takes place, if that makes some sense. I think it makes a very limited amount of sense, but that's what they want. So they will use momentum indicators. What they are saying is, if I see a stock declining in price, I will watch very closely for that stock to lose momentum, to come to the point where it's not dropping as fast as it was before. And I will assume that a change in momentum will translate into a change of trend. Sometimes that's true, but an awful lot of times it isn't true. But for a short term trader that's fine, because he thinks: I don't care, if I simply have a clue whether there might be turn in the next day or so, and I act before the turn comes; I am willing to accept all of the other times when it doesn't work out; when I think it's going to turn. I'll buy, but if it doesn't work, I'll quickly reverse myself and get out. But for a longer terms investor that's a frustrating experience to try to go through. There are indicators like stochastics that produce a huge, uncomfortable number of whipsaws, which cause you to buy or sell, and then you quickly have to turn around and reverse yourself again. Those are the most frustrating types of indicators that I've seen. There are indicators based upon theories. For example, there is the Gann Theory, and the Elliott Wave Theory that I talked about before. Some people try to use astrology to divine what the stock market is going to do. In each of those cases what they do is they put those theories in front of the action of the market itself. What they are saying is, our theory is right, and the stock market, if it's not doing what our theory says it should be doing, is wrong. I just don't have any patience for that kind of thinking. Cycles are another area that bothers me, because they are used in a very simplistic way. Cycles are something that people like to believe in. They like that the world operates on some kind of repetitive basis. If, when you make a mistake, you knew you would get a chance to redo it 10 or 12 times in the future, wouldn't that be a wonderful thing? Consider, for example, the cycles of weather. The degree of error that exists in the weather is substantial. And if you were investing your money based upon whether tomorrow is going to be warm or cold, or rainy or dry, you would lose a great deal of money. That's because people don't delve deeply enough into it to really understand the process. Cycles

exist in everything in life. They are all over the place. But, it's a complex subject that is not well understood, and people tend to rely on them too easily without really understanding them. So, I think there is a lot of money lost because people have taken them too lightly. Those are the main ones that I don't think operate as well as others. Part of the problem is the indicator itself, and part of the problem is the way people observe the indicator, or react to it. The way one person reacts to an indicator can be completely different than the way another person reacts. With cycles, for example, a novice wants to be everything nice and simple and without variation. A more experienced investor that uses cycles recognizes that there is variability to the cycles, and that they are not the same length or amplitude all the time. If you don't understand that, you probably don't understand very much at all.

J: What would be the flip side of that? Which indicators do you consider to be the most reliable?

PD: I really firmly believe that the most useful indicators are supply and demand, or the money flow, which you analyze through price action and volume. Those are the real keys to the stock market as far as I am concerned. I don't know of anything that works better or that's more basic. Everybody recognizes that supply-demand analysis is essential in almost everything else in life, buy they don't always recognize that it is essential in the stock market. Most people would say that the best time to buy a car is the end of the season, when there are cars stacked up in the parking lot and nobody wants to buy them, because everybody wants to buy the new model. What is that? That's the supply and demand analysis. The best time to get a cheap deal is when the parking lot is full of cars, that is, the supply is high, and the demand in the show room is low. The best time to buy an air-conditioner is on the coldest day of winter, when people are thinking about buying heaters rather than air-conditioners, because that's the time when supply is high and demand is low. Everybody understands these things. But then when it comes to stock market, they say, no, it's really driven by earnings and dividends, and it's not. When there is more demand for a stock than there is supply of that stock available, then the price goes up.

J: Do particular specific indicators used to measure and analyze supply and demand stand out as particularly effective?

PD: The mistake that investors tend to make is to try to simplify the process too much. Imagine you were to go to a doctor and tell him you were not feeling well. If he were to say to you, well, I'll conduct only this one test, I'll measure your cholesterol, and that will tell me everything I need to know, you'd say, I am out of here because one test isn't going to do it. You'd tell the doctor: I want you to run a bunch of tests on me, I want you to look at my blood pressure, at the pressure on my eyes, the texture of my skin, my heartbeat, my breathing; I want you to run a whole series of different test on me, all of them to help you measure my health. It's exactly the same thing with the stock market. There are a whole bunch of different things that will help to measure the health of the stock market. Volume,

for example, is extremely important, because it's a direct indicator of investor confidence. If the volume is expanding on the upside, that means that investors are confident enough about the future that they are willing to take more money out of their wallets and invest in the stock market. If you see volume contracting, that's a strong indication that they are not taking money out of their wallets. In fact, they are probably putting money back into their wallets. Price action itself is, obviously, a huge part of the process, as is the market breadth, which measures how broad the buying enthusiasm is. Are investors buying over a large number of stocks, or are they simply buying over a narrow sector of stocks. We know clearly that, in the last stages of an uptrend, buying enthusiasm generally narrows dramatically, which is what happened with the nifty-fifty in 1972-1973, or the tech stocks and the dot-coms that we had at the top in 2000. That's a very common thing that you can trace all the way back through history. So market breadth is an important part of the process. Momentum is a big part of it, too. Momentum is also related to breadth. We look at the percentage of stocks that are above 10-day, 30-day, 10-week, and 30-week moving averages. That shows us, again, whether the buying enthusiasm is broadening or narrowing, whether stocks have failed to participate in an uptrend, or are actually improving as they reach the bottom of the decline. So what we are doing is applying a series of tests to try to measure the health of the stock market, like a doctor would do. One indicator just doesn't do.

J: How do you test patterns or indicators before you start using them in real trading? Do you ever ask for other people's opinion when you are making such decisions?

PD: Most measures in technical analysis are based upon simply trial and error. We have to go back through history and look at these indicators to see if they have any validity to them at all. So it's very much a case of learning from the market itself. As I mentioned, the advance-decline line, which is a very common indicator, has some distinct advantages in that it normally deteriorates significantly about 4 to 6 months before major market tops. That doesn't help you at all at market bottoms. It really doesn't tell you anything at market bottoms, because market tops and bottoms are psychologically entirely different. And so you have to recognize that some indicators are good top indicators, while others are good bottom indicators. Not too many are good at both tops and bottoms. All of them are based upon somebody just trying these things over long periods of time, and then if they don't work any more, you just stop using them.

J: I see, so you test them on historical data.

PD: Yes. And there are some indicators that used to be very useful, but, because of the evolution of the market, are not useful any more. People used to look at odd-lot trading, which refers to purchases or sales of less than 100 shares. That was considered to be an indication of what the small investor was doing. It was supposed to be a reverse indicator, in other words, when odd-lot buying became very active, it was an indicator that the market was probably ready to turn back down again. But, the amount of odd-lot activity has

dramatically diminished, and it was used heavily by traders who were trying to get around the rules of selling short. So, they would put an order for 90 or 95 shares, rather than 100 shares, where they had to short on an up tick. That way they would get around the rules. The data became unimportant, and it has just kind of disappeared. Practically all technical indicators are based on practical studies of historical data. The interesting thing is, if you were to run fundamental data on real time against the stock market, you'd find some dramatic weaknesses in the fundamental story. So, the fundamental data is, I think, much more irrational than technical analysis indicators. If you look at earnings trends during the period from 1929-1933, the stock market was down, the DJIA was cut in half, before earning stopped going up. And the same thing was true in 1973-1974. Corporate earnings improved almost all the way through 1973-74, while the market was dropping dramatically. And yes, fundamental analysis would typically tell you, don't worry what the stock market is doing, just buy based on fundamentals. That's just not always based upon the factual evidence.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

PD: The market generally moves in one of two patterns, either trending mode or a trading mode. If you can't distinguish between the two, you have a problem, because many indicators that work well in a trending market don't work at all in a trading market. So a major consideration in using any indicator is what kind of market you are in. The other thing is, as I've mentioned before, many investors think that indicators ought to be good at both tops and bottoms. That's just not true. A set of indicators that you use to see market tops, and a set that you use to see market bottoms, are almost entirely opposite.

J: Is the number of indicators you follow greater when your trades are larger?

PD: If you are investing a small amount of money, it's usually because your client only has a small amount of money. But that's all the money that they have in the world. So, it may be small to you, but it may be huge to them. I think you use exactly the same amount of caution, concern, and care in managing a small account as you would in managing a big account. The principles are exactly the same, the amount of money isn't really important. The question is, is you analysis thorough, is it accurate, is it objective, and I think you go through that exact same process regardless of whether you are investing a thousand dollars, or a billion dollars. The goal is to always do as thorough a job as you possibly can in your analysis, regardless of the market conditions or the amount of money invested. What you have to do in order to be able to make money for clients, is you have to be so confident in your analysis, that you are able to take a position and stay with it. Even when it seems like it's easy to make money, you have to stick with your analysis, you can't let yourself fall into that trap. Otherwise you are allowing your emotions to make the decision, not your analysis to make the decision. You always need to suppress your emotions and let the market tell the story.

5.7.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

PD: It hasn't evolved anywhere near as much as it should have evolved, I think. We still tend to do a lot of things today the same way we did them 35-40 years ago. For example, a lot of people used 10-day or 100-day moving averages, and particularly 10-day moving averages, and the reason they did that was because you used to be able to add up a column of numbers by hand and move the decimal place over along the line, and that divided it by 10. And even though now we have all these super-fast computers, people are still using 10-day moving averages. And if you ask them why they are using 10-day moving averages, they'll tell you it's because they've just always done it that way, rather than saying 10 days is a good time period to measure. It's not a good time period to measure. A little earlier I mentioned what I call the concept of segmentation, which is not a popular theory at this point, but we hope it will be at some point in the future. So many investors want to view the market as one huge market. That just isn't true any more than saying we are looking at Americans and all Americans are the same. They are just not. They are dramatically different from one another, and unless you recognize those differences, you are missing out on some wonderful opportunities. There has been very little done in terms of segmentation. There have been some new investment vehicles that have come along that helped technical analysis greatly. For example, I think that the exchange traded funds are going to be an extremely important factor in money management and in technical analysis in the years ahead. You can't really apply fundamentals to them, so if you are going to be successful with ETF's, you are probably going to be successful because of technical analysis. I have a wish list of new things that I want to try. I had dinner with a fellow the other day who asked me my age, and after I told him, he said, you still seem to be excited about this. I said, well, I don't think I am going out of the door tomorrow. I think the more I learn about this, the more I realize how much I don't know. And the more we have computers available to us, the more we see how much more information there is buried down inside the numbers. So I think there are going to be dramatic changes in technical analysis in the years ahead, and I hope people will understand more thoroughly what they are doing with technical analysis than they do today.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions? Also, do you do so just to know what others might be doing, or do you also update your own strategies as the field evolves?

PD: Sure, all of the above. We like to be aware of what other people are doing. Some of the best ideas you ever come up with come from just talking with other people in the field. Sometimes just a little hint or a germ on an idea can all of a sudden bring out a whole new thought. I went through that just this week. I've been struggling with how to measure

divergences, where the price of a stock is rising, but the buying enthusiasm for that stock, the internal strength of that stock, is weakening. I was trying to figure out how to program that into a computer. I know how to see it on a chart. When I see it, I know what it is, but to be able to define that is tough, and I've been struggling with that for probably a year. And I just saw something that I thought was related, and that, it turned out, wasn't related, but it gave a germ of an idea, and I ended up figuring out how to program a divergence this morning. So, we are constantly trying to talk to other people and get new ideas. I don't think that there are that many new indicators. There aren't that many things that you can do. It really comes down to saying you can find ways of measuring changes in prices, changes in volume, or changes in momentum. But that becomes a pretty scarce territory after a while. There isn't much else to work with. There are a lot of indicators that have been developed but that really don't have much substance. People are often creating them for commercial value, rather than market analysis value. But even there sometimes you see something that could be valuable if only it were done in a different way.

J: To what extent has the introduction of the variety of computer software aided the craft? To what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

PD: Computers have been critical to everything that we do. Most of the programs that we use are home-grown. We don't use too many canned programs, other than word processing and things of that sort. But we create ourselves all of the statistical programs that we use. One of the things one needs to realize is that with all the advantages come the disadvantages. One of the disadvantages for a lot of the novice investors is that the industry has created software that makes it so easy to generate numbers, graphs, or indicators. Most of the software packages today will have literarily hundreds of different indicators that you can program in an instant. So you find people using indicators without having any idea as to what these indicators are trying to measure and what their historical record is. People are risking their money with that. That's a shame. I think that you should almost have to prove that you have some basic knowledge about these things before you are given a free license to just go out there and lose your money. I guess it's like everything else in life. Cars have big advantages, but they also have big disadvantages. Everything in life is that way. I think people can invest their money today with less knowledge than ever before, and feel more confident about what they are doing than they could have felt ever before. That's a big disadvantage in that they are not stopping to learn. They think a software package has all the things they need, and they really don't understand basic principles involved in successful investing, literarily the ones that relate to knowing yourself and your limitations, knowing when you are in over your head. They can be successful with that, but that success lasts just long enough to set them up. In other words, you've got to get set up before you can get knocked down. In an awful lot of case that easy software is a disadvantage rather than an advantage. You need to know what you are doing in anything. If they came up with software to do brain surgery, that would not be a good thing. You need to know what you

are doing before you start doing it.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

PD: I believe it's very true, though nobody has time to do it. You develop more of a feel for the charts when you are doing it by hand. But it's like with everything else. If you stop when you meet somebody and you shake hands with them, it's a whole lot different than when you see somebody walking by and you have no physical contact with them. It's the same kind of principle. The more you get acquainted with the chart, the better of an understanding you have of what's on the chart. When you look at a chart that someone else has created, you tend to just glance at it, you don't get involved with all the little details.

5.7.5 The innovative process

J: What drives your innovative process?

PD: Curiosity. Search for a better answer. A really strong sense that we just do not have all the answers. The more you learn about the market, the more you realize how much you don't know. And, with some of us, at least, there is a strong burning desire to get better with what we do, and to discover new fields, new areas.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

PD: No, these are the same classical indicators, they are just applied in a more complex way. For example, as I was mentioning, people have always had the tendency to think of a stock market as a single entity. What we have discovered is that it's not a single entity. Big caps move differently than small caps, technology functions differently than finance, utilities tend to be different animals than transports. All of these things are markets within markets within markets, and you have to uncover those cross currents. International securities is literarily almost like a brand new field. I can remember as recently as the 70's when the idea of international investing was almost unheard of. People just didn't do that. Today, it's a very important area of consideration. So we are using the same tools, but we are applying them in a much more complex animal. It's almost like doctoring was in the 15th century. They would bleed you about once a month, and that was about all that you needed to stay healthy, whereas today it's a very complex and there are all kinds of tests. So they are using essentially the same approach, only on a much more complex basis.

J: Do you and to what extent collaborate with others during the innovative process?

PD: Absolutely. I think that's part of the fun of it, to hear from other people, what they have tried, what they haven't tried. You can shortcut the learning process substantially by finding out that other people have been working on these same problems. Two heads are always better than one.

J: How soon after you develop a particular technical tool do you make it accessible to public?

PD: That depends on the significance on the indicator, and on the amount of testing that you can do. I am generally uncomfortable without at least ten years of back-testing. You see a lot of young people who say, I've got two or three years of back-testing, and that's all I need. Ten years is a short period of time. Our original data goes back to 1933. We've extended that one step back, to 1925, and now we are staring to take it another step back, to 1918. We would like to have more data available to us so that we can thoroughly test new ideas in both bull markets and bear markets. If you think about it, since 1925, for example, we've only had five bear markets. The question is, how much can you know about a bear market if you have only seen five of them, and you've only lived through a few of those. If you had 150 of them, you might feel like you knew something about what a bear market was, but with five of them, you really don't. If you took five Italians and stood them up and said, this is what all Italians are like, you'd surely be mistaken. I think the same thing is true with the market. If you are operating with a limited amount of data, you are very likely to make some serious mistakes about what a period of advance looks like, or what a period of decline looks like. The longer the period over which you can test, the better. For example, we've been working on some stuff here for five or six years, and we are nowhere near releasing it. Let me give you another example. Since we've got a 70-year history of the NYSE, we created an analysis of the Nasdaq exchange, and we started releasing the data after about two and a half years, because we had this parallel history of the NYSE. But we still don't try to place too much importance on that analysis because we don't have a long enough back record. We simply say, here is the information, don't make too much out of it, but use it as a general guide. If you see the same patterns of strengthening and deterioration that you typically see on the NYSE, it ought to have some value to it, but don't bet all your money on it.

J: You yourself use all the time the technical tools you developed?

PD: Yes.

J: So there are tools that you developed but never shared with the rest of the world?

PD: Yes, we are doing that all the time.

J: For the ones that you do share, why do you share them, rather than keeping the edge

just for yourself?

PD: That's a good question, and I really don't know the answer. I think part of it may be because I am really more comfortable in an analytical world, than I am in a portfolio management world. I used to think portfolio management was all about just managing money, and I found out that you actually spend more time managing clients than you do managing their money. That didn't particularly appeal to me. I don't like the hand-holding process too much. I am more comfortable just being in an analytical world. So, that's part of it. Also, maybe some of us like to be teaching other people. Other than that, I really don't know the answer.

5.7.6 Emotional aspects of the craft

J: Has it become easier to lose as you became more experienced?

PD: This goes back to what we've been talking about earlier. Chapters 1 through 4 of my book would talking about who is your enemy, who is it that you are competing against, who is it that's trying to take your money away from you, who is it that's trying to ruin you. And the answer is, you are. You are your own worst enemy. You are the one that gets emotional, you are the one that starts making decisions based upon what you think you'd like the answer to be, rather than on what the answer really is. You are the one that allows greed or fear to get into the picture. The first objective in being a good investor is to control those factors. If you don't control those factors, nothing else counts. And so, if you, through experience, reach the point where you can say, I don't need to look at my indicators any more, because I already know the answer, then you are reduced to the level of a novice. You are saying, I don't need to know anything that I am doing, I can just do it without having to know. Well, that's what a novice thinks, and novices loose money. So, a part of being a professional is to never let down your guard, to never give in to those emotions, to never surrender that discipline. If you do that, you are done, you are finished. And you can go back and look at famous analysts such as, for example, Joe Granville, who let down his guard, and let his emotions and ego take over. He had a very large ego, and he ruined himself because of that. He'd start saying, the market is wrong, I am right; or, I know more than the market does. And he caused thousands and thousands of people to lose enormous amounts of money, because he was not disciplined, because he was not objective. So that's kind of a starting point in this whole thing. Whether you are operating on a fundamental basis, on a technical basis, on whatever basis you want to operate on, you have to do it in a highly disciplined way. It's like saying, if I were a race car driver, could I at some point start driving with my knee, instead of with my hands. Sure you can, but you are going to crash. That's not smart. A smart professional keeps both hands on the wheel at all times. Never depart from those standard rules. And that's particularly important in managing money and particularly important in technical analysis, because there the whole process depends on objectivity.

J: How has the extent to which your emotions interfere with your craft changed since you first started?

PD: I am no less of a human being today that I was when I was 20. But improving your discipline is a constant process. It's something that needs constant works. The more you work on it, the more trained you become, and the more you automatically react in a disciplined way, without having to think about it. The emotions are the same, but I think that I have less of a problem controlling them than I did when I was 20. I keep going back to this, but I really think that's a key to everything. If you are an emotional surgeon, that's not a good thing.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

PD: Oh, it can be learned. All discipline is learned or imposed, but eventually learned. We are really victims of our emotions to a very, very large extent. The whole field of behavioral finance is discovering this finally. I think technical analysis has known for a hundred years that most people make their decisions heavily influenced by emotions, and not by logic. That's a good thing in a lot of parts of life, but when it comes to making or losing money, it's a much better idea to be highly disciplined and highly objective. That's something that you have to impose on yourself and commit yourself to, and practice and practice and practice.

J: Has a big loss ever made you doubt the validity of technical analysis?

PD: No. First of all, beyond my early learning process, I haven't had a big loss. I've had lots of small losses. A big loss occurs when the market is telling you need to take some action, and you just refuse to take the action because of your emotions. You say, I am a long term investor. Or you say, it's too far down now, I am not going to sell out now, I've already got too much of a loss, I am going to wait till it comes back, then I'll sell. That's emotions talking. I like to think that I've reached the point where I simply don't allow much emotion to come into my investment process. I really can say I have had and will always have controlled losses, because I've realized that we don't have all the answers. Sometimes you'll commit to a position only to realize that you have read the information in a wrong way, and you'll have to turn around and reverse yourself. But you need to get over the process of saying I don't want to recognize that I am wrong, because that's the death penalty if you work in the stock market.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[11]*." To what extent is this statement true in your case?*

[11]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

PD: That's exactly what we were just talking about. Every investor goes through a process of being a human being and trying not to be a human being at the same time. That's a very difficult process. It's something that you've got to fight constantly.

5.7.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

PD: This goes back to what we were talking about earlier. Certain people have certain characteristics. A trader has different characteristics than an analyst. It's hard to make generalizations about these things, but I'll make generalizations anyway and suffer the consequences. As a general rule, traders are much more interested in doing things, so they tend to rely on analysts to be the creative ones. The analysts are usually the ones who will spend hours and hours pouring over piles of statistics, looking at charts, analyzing, and doing back-record studies. Most traders don't have a spirit for that kind of thing. They say: let's get down to it; tell me, should I buy or should I sell; give me something to create some action here. My experience has been that most creativity comes out of analysts, not out of traders and not out of portfolio managers. So it's kind of segregated. I've been a proponent that we need to do something special for the analysts because they create a large number of the new ideas. Of course, if traders were listening to me, they would now be angrily jumping out of their chairs, because there have been a lot of traders that have also been creative. But I think, overall, most of the new ideas come from the analysts.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

PD: I don't know. I've found through past experience that people who have a mathematical mind tend to be more inclined. There are a lot of people with engineering backgrounds that are very, very effective technical analysts or portfolio managers. Those who enjoy probability, statistics, and operating by the numbers, as well as those who come from disciplined backgrounds, tend to be inclined. For example, people in the military tend to be good technical analysts, because they've learned the importance of discipline. But I've seen just as many individuals study technical analysis and become very effective at it, because they have gone through the process of using other methods and being totally disappointed by them, and have started searching for a better way. Technical analysis doesn't have to be too terribly complicated. It is the law of supply and demand. The basic principles and concepts can be very easily understood and can be used in a generalized way. People know that they should buy when the stocks are down, not when they are up. Things of that sort can be applied without necessarily studying statistics, or spending hours pouring over data. The basic idea can be applied to a portfolio fairly easily.

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

PD: I don't think so. If you don't have those basic traits, if you don't have the ability to control your emotions, you are doomed from day one. That is what destroys investors more than anything else. Typical investors tend to buy at the top and sell at the bottom, because that's what their emotions are telling them to do. It's easy to do it that way. You buy when everyone else is buying, because that makes it comfortable, you feel like you have a lot of company. You don't feel like buying at the bottom, because it's not comfortable to buy at the bottom, news isn't very supportive of your position, you can't find anyone who'd talk to you about it, and if you dare to say I'd been buying stocks people will tell you that you are a fool. So you tend to do the easy thing. Well, that's the way to lose. You end up buying at the top and selling at the bottom. The trick is to have the discipline, the emotional control, and the objectivity to be able to buy when no one else wants to buy, and to be able to sell when nobody else wants to sell. That's the way to be successful, and without that, nothing else matters.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

PD: I honestly don't know the answer to that. You have to program the machine first, and the person who is programming the machine has to be a really good analyst. I don't think there is any way to teach one computer to program another computer. I don't think that will ever happen. But, can the programmer do a really effective job of programming a computer, and then have the computer carry out the thought process? I think probably so. And I think the evidence of that is the amount of programmed trading that exists on the floor of the exchanges now. The majority of the volume on the exchanges is created by programmed traders, and they wouldn't be doing it if they weren't successful. So, can computers be programmed to produce a profitable trading program? Apparently so. Could a computer ever figure that out for itself? No.

J: But will a computer ever be sophisticated enough to completely replace a human technical analyst?

PD: The purpose of a computer is to carry out programs that have been placed inside of it. Can programs be programmed? Yes. Can someone create a program so complex that it begins to approach the level of human thought? Yes. Can you ever buy a computer that you can just plug in and have it run your investment portfolio? No. Could you ever go to a store and buy a program that was programmed by somebody else? I doubt it, because I think that if someone were that knowledgeable about market analysis and that knowledgeable about programming, then they probably wouldn't give it to anyone else, they'd keep it for themselves.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

PD: I don't agree with that, because I think technical analysis is a study of human psychology, as measured by the law of supply and demand.

J: For you it's more science than art?

PD: Well, it's an art to the extent that psychology is an art. Of course, psychologists will say that their subject is a science. But there is an awful lot that you can't quantify statistically, so I personally think that psychology is largely art. The human mind is too complex. We haven't even began to approach the point of being able to statistically understand what goes on in the brain, much less what goes on in mass brains. So, to that extent, psychology to me is art. Then there is a math side to this that comes from the law of supply and demand, where you say, we are going to watch investors, and we are going to measure what they do in statistical terms. Statistical terms are very much a science, but the human emotion that's involved and that we are really ultimately getting to, is very much an art. So, from that standpoint, technical analysis contains both the statistical side and the artistic side, and there is no way around that. But is it anything you want it to be? I don't think so. I think it's confined to measuring what human beings are doing with their money and measuring that in terms of the law of supply and demand. That's a relatively narrow structure. A lot of people will say technical analysis includes astrology. I don't agree with that at all. I think it only comes from measuring the actions of the investors as they buys and sell. Anything other than that is not technical analysis.

5.7.8 Luck, astrology, etc.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

PD: Absolutely. We are learning more about life all the time. I think over time we'll find that electric impulses, gravitational forces, and all kinds of other things, have an effect on out lives. We know that moon has an effect on our lives. We can see it in the tides. If it can pull oceans up and down, it most certainly must have an effect on us. We are affected by day and night, by the seasons of the year, and by a lot of other cycles that exist in nature. So, I am not saying that my mind is closed. I am simply saying that some aspects of astrology to me are purely fraudulent, and some aspects of it are beyond our current comprehension. And until they become a part of our comprehension, they have to be put aside. They have to be statistically proven before they can be used, and I have never seen a valid statistical proof of them. I have had astrologers tell me that when Mars is in some aspect, it will affect war. When I asked them why is it that Mars should have more of an effect on war than

Jupiter or some other planet, the answer that I got was because Mars is the god of war. At that point my eyes glaze over. That's fraudulent to me. So, I don't mean that the Earth is flat and that it will always be flat, but I do think that it's important that if anyone is presenting information that they want you to use to manage your investment portfolio ought to be able to provide a statistical proof of its ability to produce good answers. I've never seen that out of astrology.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

PD: I think a lot of them are religions. When you talk to people who advocate those approaches, they speak of it almost as of a religion. They say that it is right and that the market is wrong. Any approach that takes a position that says I am right and the market is wrong to me is just fallacious right on the surface of it. The market is always right. What we are trying to do is take profits out of the market. And to take a position in saying the market is wrong and I am correct is just beyond understanding for me. If we were to take the approach of saying there are cycles and pressures that affect us, that may well be true. That probably is true, even though we can't prove it today. If we took the position of saying people are not in as positive a mood in the winter time as they are in the summer time, psychologists would say that that's recognizable and that it can almost be statistically proven in a number of ways. So the general idea of that is perfectly acceptable to me. But when you say it is winter, therefore it is cold, that's wrong. You could say it is winter, therefore it is more likely to be cold than warm, that makes more sense. But to say it is December, therefore I am going to wear a parka no matter what, and I am not even going to bother to put my hand out of the window to see what it is like out there, that doesn't make any sense. Most of these religions, as I've called them, break down because they are placed in front of the reality. The reality is what's going on: investors are buying, investors are selling, the market today is up strongly. To sit there and say no it isn't up strongly because my cycle says it should have turned down a week ago is just flat out wrong. I consider those things to be background indicators. If you want to use them, use them, but use them as background indicators. You could say, well, it ought to be cold, or the market ought to be in an area where it could be vulnerable, but now let's look at the numbers and see if it really is vulnerable. For example, I've just spent a weekend at a conference with a number of Elliott Wave people. I was pointing out the fact that the non-weighted index of the S&P500 is at new all time highs right now. So how can it be a bear market? And their position was, don't confuse me with the facts, it's a bear market because Elliott says it's a bear market. I just don't have patience for this sort of thing.

J: What is the role of luck in technical analysis?

PD: You make your luck. There are certain surrounding factors that tend to encourage luck, and part of that is discipline, objectivity, sticking to the numbers, letting the market tell you the story. Then you tend to become lucky. By the same token, ignoring that kind of thing will guarantee that you will be unlucky.

5.7.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis? Did you become more or less convinced since when you first started?

PD: Oh, absolutely. It's like with everything else in life. You think that a certain principle ought to be correct, but you don't have absolute confidence in it, unless you have a lot of experience. Sure, I am a lot more confident about the value of technical analysis now, about the value of supply and demand analysis now. The way that we conduct our analysis, I am very confident that I will never be caught in a major bear market, and I will never miss out on a major market advance. And that's all that I can hope for. So, as long as have that, I feel absolute confidence.

J: When you were younger, when you were starting out, have you ever have doubts about the validity of technical analysis?

PD: Sure, it's like with everything else. Your confidence comes with experience. It's only after seeing it repeatedly produce the results that you thought it should, that you really have a high level of confidence in it.

J: Which special moments of your career have been critical in determining you level of confidence and conviction in technical analysis?

PD: I can't think of any one particular event that was significant. I think it's a collection of very small, almost daily experiences of seeing the analysis work out. I can't think of any particular day that was kind of a revelation to me.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

PD: I think it's kind of disappointing. I guess I don't understand their side of the thing. I think to a large extent we are dealing with semantics. As I mentioned earlier, chapter one of every economic textbook on every campus in the world is about supply and demand. So, we come from that academic environment. We come from that starting point. There technicians and academics are on exactly the same page. Then, more recently, behavioral finance has come along directly from the academic community. And behavioral finance espouses positions that that technicians have been espousing for probably over a hundred years, that is, that investors are responsible for the movements of prices, and that they make most of

their decisions based upon emotional rather than factual considerations; that they therefore make a great deal of mistakes; and that the degree of emotional influence is so pervasive that we really ought to be spending our time measuring that emotion, than to be measuring the influences that created the emotion in the first place, which would be fundamentals, earnings and dividends, corporate and economic developments, and so on. But that's precisely the same thing that technicians are saying, that is, we don't know why people are buying or selling, they themselves don't know why they are buying or selling in a lot of cases, but the fact that they are buying and selling does cause prices to change on the exchange and that we can measure those changes with the law of supply and demand. I think we are preaching the same information that the academic community is preaching, and yet, they somehow say that we are doing something entirely different. I think to a very large extent technicians are their own worst enemy. They tend to talk in a language that academics don't understand. And we all as human beings have a tendency to say, if I don't understand the language that you are using, I reject you. The French don't like it when we come to France and speak English. That's a perfectly human trait. And the academics don't like it when we come and talk about the head and shoulders, and pennants, and all of the other arcane language that we use. That's a major barrier. We need to talk in more general terms that everybody can understand. So I think we are largely responsible for our own position in the world.

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

PD: There are a lot of books that were written in the 30's and 40's. There was an awful lot of progress made in technical analysis during the 20's, 30's, and 40's. I think maybe the devastation of 1929 forced people to start looking for other answers. A lot of the wisdom has been passed along, and people have accepted it thinking, it's in a book, therefore it is. And technology has helped us get at the data that we could not get at before. For example, I've read a lot of books on technical analysis that say that when volume expands on a rally or contracts on decline, that's a very good sign. Well, if you don't know whether the volume is coming form buyers or from sellers, you really can't make that kind of a statement. In other words, what if you could know that, and what if you found that your volume was expanding right near the market top, but that the volume expansion was coming from sellers. If the sellers were dumping huge amounts of stock into the market near a top, that would not be bullish. So there are a lot of books that have incorrect information based upon technology that we have today. They were correct at the time at which they were written, but are simplistic nowadays, when we have a lot more information. But, if it's really on technical analysis, and not on these other subjects that tend to hang around technical analysis, I can't think of any. Every once in a while you get someone writing a book about any subject at all, and they don't know what they are talking about. That's a separate thing. But a knowledgeable person writing about technical analysis, it's a relatively narrow field, so you can't go too far afield.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

PD: I don't think there are hard and fast rules about much of anything. This goes back to the fact that we are measuring human psychology, and I don't think there are any hard and fast rules that can be applied to psychology. Are there hard and fast rules about how to raise a child? Are there hard and fast rules about the law? Are there hard and fast rules about how to drive a car? I don't think so. I think there are some strong general rules, some basic principles have to be observed, but you don't want to get into a situation that is rigid, you want to have some flexibility to see beyond some rules. Fundamental analysis doesn't provide hard and fast rules either, and I don't think it can. I am not saying that discouragingly, I am just saying, everything that deals with human psychology can't be too rigid. It just doesn't work. Human beings are too arbitrary.

J: Do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

PD: Well, if all technical analysis comes directly from the law of supply and demand, then, absolutely, the law of supply and demand can be applied to any commodity whatever it might be. It could be horses, airplanes, steel, land, or anything else. When the law of supply and demand says that the demand for a commodity is greater than its supply, it makes not distinction as to what that commodity might be.

J: I am also curious as to what extent would these indicators work when applied to the data that has nothing to do with the markets, like the weather data, for example?

PD: There are a lot of tools used in technical analysis that don't necessarily belong to technical analysis. For example, moving averages are basic mathematical concepts that could be applied to anything: to changes in corporate earning, to weather, or to anything else. How could you tell with greater certainly that the weather is changing from winter to summer? Well, you plot a series of daily temperatures and run a moving average on top of that. If you pick a correct moving average, you'll find that the temperatures eventually rise above the moving average, that is a pretty good sign that the weather is changing from winter to spring. And that can be applied to anything. It can be applied to artillery shells being shot off – you tell that they are coming down when they cross the lower moving average. But then there are these other tools that are designed to deal specifically with human psychology, where there is a consistency in the human behavior. For example, as I've mentioned earlier, towards the end of a major market advance, buying enthusiasm narrows. That is something that's unique to human behavior. It wouldn't apply to weather, to farm production, and so on. It's specifically designed to measure human psychology. So, I think you really need to tear that down a little bit more, and say which of the tools that we use are just mathematical computations and aren't unique to technical analysis at all, and then those that do help

to measure investor psychology, the uniqueness of the mass psychology and the human mind.

J: Would you classify the continuation and reversal patterns in the group specifically designed to measure human psychology?

PD: I think things like head and shoulders are probably unique to human behavior, because they are a reflection of human emotion and human psychology. In its simplest form, if you think about head and shoulders, all it is, it's a series of attempts to rise to a peak. And then, when any trend ends, it ends by simply not being able to exceed the previous peak, and that's what creates a head and shoulders pattern. But I think head and shoulders is unique to human nature, because what happens is, the minute the market sells off from its high, there are investors that say, oh, that's an opportunity for me to buy back in again. That's what completed the head and shoulders pattern. I don't think you would get that with a lot of other nonhuman measurements that just happen to be in nature.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves, so that you feel that you can make up any loss, even a very large one?

PD: First of all, I am a very strong believer that technical analysis doesn't forecast much of anything. There is a big difference between measuring and forecasting. If you say to me, I think that, based upon whatever I am using, the weather in three weeks will be such and such, I am very skeptical about that, because what you are doing is predicting the future. I've never seen that anyone anywhere in life could accurately predict the future with any consistency. Therefore I think that anyone who says that they are predicting the future is a fool or a liar, one of the two. In other words, I can't tell when it's going to rain, but I can tell you when the sky starts filling up with clouds. And I can't tell you when the rain is going to stop, but I can measure it, and when the volume of drops coming down stops, I can say it's stopped raining. I think this is one of the places where academia may find fault with technicians, because there are a lot of technicians that like to give the impression that they can forecast the future. And I think academia says, we have never found anyone under any circumstances, anywhere, that could predict the future. Therefore, this is fakery. But what you can do is you can measure situations as they exist. Let's say everybody is running in one direction. When are they going to stop? I have no idea. But when they stop, I will see it, and I can react to it, and I can act on it, I can say, well, they stopped. And if they all turn around and face in the opposite direction, I can say they are not going in that direction any more, and therefore I am able to expect a different type of behavior from them. Well, there is a very important distinction there. One is measurement, and the other is prediction. If you follow technical analysis in a very disciplined manner, the net effect is that, except for the totally unexpected, it dramatically reduces the chances of your being blind-sided and taking a dramatic loss. That's the whole point of technical analysis, I think. A distinct advantage of technical analysis is in diminishing risk. Its strength is not to just produce dramatically greater gains, but to have your portfolio improved, because you don't

keep giving back your profits. So the focus, to a very large extent, is on loss avoidance. The likelihood of an experienced, well trained, disciplined, objective technical analyst taking a large loss is rather unlikely. Now, can they abandon their trading, can they abandon their discipline to become a pure human being, a take a big loss? Absolutely. But if you stick to what you are supposed to be doing, it's highly unlikely, because the market leaves tracks behind. When the market goes from a high point to a low point, it leaves track behind, and those tracks are telling a technical analyst, the market is weakening and you need to take appropriate action.

J: What, in your opinion, is the best proof of the validity of technical analysis?

PD: Missing out on bear markets I think is the most dramatic evidence of it. Using fundamental analysis, people generally are left to suffer the full ravages of a bear market. People rarely get out of a bear market because fundamentals are telling them to get out. More often, it's because they abandon fundamentals and react to fear and sell out, regardless of the fundamentals. If you go back and look at the bear markets, you will generally find that corporate earnings were improving all through the bear markets. So I think if there is anything that proves the value of technical analysis, it's the ability to avoid large parts of the major market declines that occur from time to time.

5.7.10 Lifestyle

J: Could you describe your working day?

PD: The first thing I usually do is go over the numbers from the previous day's market and look for inconsistencies. At the end of the day, we usually go through the closing numbers, we go through the analysis and reach the conclusion as to what today's action meant. Tomorrow morning we'll check the data even more closely, make sure that it conforms to what we thought the previous day. If it doesn't conform, we make the necessary adjustments. We may even send a report to our clients to tell them that something has happened that we didn't anticipate the night before. Then, I'll usually go and answer emails after that and make sure my correspondence is taken care of. Then, I'll usually go to our website and review it to make sure that everything is OK. Next I'll go through a deeper analysis of the market, looking for smaller trends in individual stocks, or groups, or sectors that I hadn't seen before. I'll also be taking calls from clients, asking questions. Usually, a part of the day is spent developing a new idea. We are in the process of developing a new website product. Once that's built, we are going to start on some new research projects that are going to be substantial, that are going to take a long time. It's important to plan those out. That's part of my job, to figure out how we are going to go about attacking these new projects. At the end of the day we go through the process of re-analyzing the market as it approaches closing, and then closes. We write a commentary right after the market closes each day to our clients to tell them what we think happened, why it happened, and what actions they should take

or not take accordingly. Usually two nights a week I work well beyond 5 o'clock until 10 or 11 o'clock at night purely on research projects. When you are trying new ideas you can't be interrupted, and working late at night has the advantage that everybody is gone, allowing you to really get immersed in your research.

J: How many hours each day do you spend practicing your craft?

PD: About two days a week it's about 8 or 9 hours, and then another 3 or 4 days a week, it's 15 or16 hour days.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[12].

Would you agree with de la Vega? To what extent does your trading control your life?

PD: Too heavily. My wife has often told me my first love is the stock market. There is at least some truth to that. It's a lifelong search for knowledge. Someone long ago said that the stock market is the world's biggest guessing game, and to have the sense that you found some order to what appears to be total disorder, is fun, challenging, and just never grows old. I think a lot of us are far more consumed by the stock market than we ought to be. I think the same thing is true with a lot of doctors, with a lot of lawyers, with a lot of accountants, painters, or artists. It's a passion.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

PD: It depends. Traders, for example, thrive on stress. They'll say, I could not operate without stress. It's the positive stress rather than the negative, or at least they think it's the positive stress. You generally find that the trader's occupation is a short term thing. You don't find too many old traders. But I think part of what a technician tries to do through the discipline is to overcome the stress, and don't let it get to you. That's a critical part of the process of becoming disciplined and being objective.

[12]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

5.7.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

PD: I would think that a mathematical background would be a big help. And it doesn't necessarily have to be directly related. I find that a lot of engineers or mathematicians tend to be drawn to it, I think more because of the discipline of numbers than anything else. Also, some accounting background would be very helpful. And maybe some military background might be helpful for the discipline side of things.

J: What advice would you give to technical analysis students? What is the key to success?

PD: Knowing yourself is the real key. The indicators don't mean a thing. If you don't know who you are, if you don't know where you are going, if you don't know what your strengths are, and, most important of all, what you weaknesses are, you haven't got a chance. That would be my first advice to any student of technical analysis, any student of much of anything, but particularly of the stock market, because you can lose money so fast. You have to understand that you are the enemy, and unless you learn how to control that enemy, it will conquer you. As I said, chapters 1 through 4 in my book would be just that, telling you to learn about yourself.

5.8 An Interview with Gail Dudack

5.8.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest?

GD: My interest began when I was in college but I did not understand at the time that the independent studies I had set up were technical analysis. I had a summer job on Wall Street my junior year. I worked in a research department and while there I substituted for everybody and anybody who was on vacation. There was a man there called the quantitative analyst. (These were the days when technical analysis was truly viewed as voodoo, so he was not called a technical analyst; he was called a quantitative analyst. But what he was doing was studying the internals of the market). When I helped him – he showed me how to update his charts so that when he went on vacation I could update them for him – I was fascinated. When I returned to Skidmore, I chose two topics for my senior thesis: short interest and odd lots. Both were data sets of information used to analyze the psychology of the stock market. In short, I first became interested in technical analysis while in college.

J: Did someone or something in particular inspire you?

GD: I would say the person I worked with at Pershing and Company that summer, Peter Ruggles, was the first person to inspire me. Our paths haven't crossed in a long time. The last time I saw him he was with a mutual fund in Boston, his hometown. When I returned to New York to work (Pershing and Company called me back for a permanent job), I quickly signed for Alan Shaw's and Ralph Acampora's night courses in technical analysis taught at the Institute of Finance. They are wonderful teachers. As you know, both are fantastic technicians and great role models. I was hooked.

J: Did you have a mentor? What was his or her role in your development as a technical analyst?

GD: I may be unique since I did not have a mentor. I did take Ralph's class and followed it with Alan Shaw's class. The combination provided a great foundation for understanding the basics of technical analysis. But after these classes I worked on my own. At Pershing there was no one similar. I actually asked for and got Peter Ruggles' job when he left the firm and moved to Boston. For a while I did two jobs. I did my job during the day and I updated all his charts at night. This lasted approximately six months. Slowly but surely I started writing some market forecasts for my boss. After another six months of writing, I began to publish a report on the stock market. I worked alone, but for me that was a strong suit. I learned to think independently. In fact, my boss did not *allow* me to read other people's technical research on purpose. He did not want me to be influenced by others. So when I first started writing market comments for him and for our clients, I was completely unaware of other people's thoughts on the markets.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

GD: I read some books. We all did. For example, the Edwards and Magee book is a classic. But there weren't many good textbooks until John Murphy published his *Technical Analysis of the Futures Markets* in the late 1980's. After my two classes I studied point and figure on my own. But I always say I did not become a technician until I looked at a million charts. In other words, to be a good technician you need to do it for a long time. Nothing replaces the experience of looking at the charts, having an opinion, seeing if it worked out or not, and living through cycles. It's the only way. I would say I learned through sheer *experience.*

J: How much time did you spend learning technical analysis before you felt prepared to use it with real money?

GD: That's a good question. I started doing technical analysis in late 1972 or early 1973, but I do not remember trading my own account before 1978 or 1979. I tend to be a conservative person and did not try to run before I can walk. But I do remember that after a couple of trades that I call "learning experiences" I began to see how and why technical analysis worked. It was very good to me in the 1980's. So, to answer your question, I did not put my money behind my opinions for at least five years.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

GD: This thought would go for anyone – a technical analyst or a fundament analyst. Whatever you look at – a chart/balance sheet/income statement – you must put this information into the context of the world at large. For example, 90 percent days are one of my favorite tools. It's a great tool. It tells you oodles about investor emotion. But you need to know the backdrop of the market to understand the meaning of a 90 percent day. You have to ask yourself, 'Was this 90 percent day triggered by a one-time event?' If it *was*, I do *not* believe it is as significant as it would be if it was *not* triggered by a one-time event. How to put information into the context of the current environment (and the environment is always changing) is something a book cannot teach you. For example, the trading environment is very different from the trading environment of ten or twenty years ago. There is more program trading, more derivatives, and more recently we have the addition of ETF's. As the trading environment changes, tools or indicators change as well. I have never found a book that explains this concept to anybody. You simply learn it through experience.

J: Which mistake did you learn the most from?

GD: I've made so many mistakes that I do not know which one to choose. What I have

learned over time as an analyst (and I write for professional investors) is that if you are wrong on your view of the market, it is important to be honest about having been wrong. Explain why you've been wrong and what you've learned from that mistake. Thorough this process, your clients will trust you. They will see that you were wrong, why, and what you learned from it. It took experience and confidence to be able to do this. What I have also learned is that my stomach churns before I am even conscious of being wrong. Somehow my stomach knows first! So if I am sick to my stomach for three days in a row, my market call is probably wrong. I should go with my gut at that point. This comes from having made many mistakes.

5.8.2 Personal style

J: Could you describe your own distinct style of technical analysis?

GD: I would call my style eclectic. I will look at absolutely anything that moves if I think it will be helpful to me. Some of my fellow technicians believe one should be a technical purist. I am the opposite. I am not sure how many technical analysts also function as strategists like I do. I work with technicals, fundamentals and economics. My degree is in economics with a minor in math, so I like numbers. I follow economic data; I look at sector fundamentals; I use valuation models; I believe in theme investing; I take both technical and quantitative approaches and I believe we are in a *global* environment. I'll look at skirt lengths if it's going to help me. I look at many things and I am always looking for something new. So I don't believe I have a definitive style. On the other hand, my style of technical analysis is very basic. I do a lot of plain and simple chart analysis. But simple is not easy for everyone. One of my pet peeves is that many people *do not know how to draw trend lines correctly.* I find this disturbing. I also look at relative strength and sentiment. What I add to my collection of indicators that may be unusual is flow of funds. This simply means looking at where money is invested. I look for extremes (over/under investment) in any asset class as the sign of the end of one cycle and the beginning of another. These statistics define the larger supply/demand cycle. Charts tell us about current supply and demand. So, I start with the bigger supply/demand picture and then look at the current supply/demand picture. It is a basic approach with my own twist to it.

J: How much of what you learn from others do you directly apply in your trading?

GD: I will apply anything I can to my analysis. I am always interested in reading other people's work (which I don't do often). I look to see whether I agree or disagree with them and in particular, I look for indicators I have not used. I love reading research that teaches me something new. It's that 'aha' feeling that I like to find. If I read something I really enjoy I may bring it into my own analysis. The truth is it's very hard to be creative and I rarely find something new to use. I would like to be unique or different, but it is very hard to be really unique. There are many bright people looking at the same data all the time. You can only be an expert in one small piece of that. I think that if there is something unique in

my work it's that I look at so many different things and pull it all together into one simple message. But that may not be unique.

J: How do you learn what works for you and what does not, without making big loses?

GD: I never really start to apply anything until I've studied it, tested it, and seen if it works for me. I don't make decisions on new indicators, theories, or styles until I've watched them for a long while. I have friends who use Elliott Wave or Kondratieff cycles, but I am not good at using these tools. They do not "talk" to me. All indicators are pictures of supply and demand on a piece of paper. Some indicators talk to me. These end up being my favorites and I can interpret them well – I know their personalities, and they work for me, whereas others do not.

J: Is your analysis more effective when you are working by yourself or when you are working with others?

GD: Since I have always worked alone I would have no way of knowing. I trained myself after having taken some courses, and I've never really worked side by side with another technician. This may be why when I read other people's work, I immediately say, 'that's right, that's wrong.' Whether they are right and I am wrong is another question, but I have an immediate reaction to it in terms of what is and what isn't working. So I guess I work best alone.

J: In general, is technical analysis better done working individually or in teams?

GD: Again, I don't know, because I've never worked in a team, so I wouldn't know if it works better that way. There aren't many firms that have big teams of technical analysts today. I wish there were more. But I haven't worked in such an environment.

J: In what kind of market conditions do you make most mistakes?

GD: The hardest part of the cycle for me is the middle to late stage bull market. This is also the middle of the economic cycle which means that the economy has done well for a long while and investor complacency has set in. It can be difficult to outperform in such an environment. Stocks are generally moving up, yet there are no obvious signs of a top. It is like everything is on hold. Economists provide good guidance in the middle of a cycle, but they do not have the tools to see the train about to hit them when the end of the cycle is near. On the other hand, technical analysis excels at tops and bottoms. It's excellent at defining turning points. Technical analysis is very good a saying, 'it's getting too hot here' or 'we have really overshot.' That's where technicians can step up to the plate and hit a home run; we can "see" the extremes. I find it's harder for me to be outstanding in the middle part of the cycle. Since I find that fundamental analysis works best in the middle of an economic cycle or the middle of a bull market, I might switch my focus in mid-cycle to

relative sector value, stock strength, and earnings strength.

J: How much of what you do are you willing to share with others?

GD: I write for money managers, who are my client base. In the process of my writing, there are no black boxes or secrets. My writing explains why I've taken a particular stand and which indicators I am focused on. So I believe I share everything which is the way I like it. I don't enjoy reading reports that state 'here is my view, take it or leave it.' I am not interested in that. I already have my view and I want to see if your analysis challenges or underscores my view. So I write the way I like to read. I share everything all the time; I share my technique a hundred percent. Several times college professors have called me and asked if they could use my work in their research. The answer is always yes. I think that's great. It's an honor, just like this interview is. I have also taught night school at different times. I applaud people like Alan and Ralph who have worked all day and then taught at night for many years. These are special people. I've done it from time to time, and I find it to be very exhausting.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior success?

GD: This is a great question but it is also the greatest mystery of all. And, in fact, whether technical analysis is an art or a science is one of the big debates in our industry. I think it comes down to two words: your gut. Why can two technicians can look at the same chart and not necessarily have the same view? I do not know. Few things in life are perfectly black or white; most is some shade of grey. I think this is the art of analysis – describing the grey. A large part of technical analysis is science I my opinion. It is measuring supply and demand. But usually I describe myself as a person who is good at guessing the picture behind the puzzle when I don't have all the pieces. The pieces are: flow of funds, charts, sentiment, etc. Some people can figure out the picture and others can't. I am not always right, but I find I love guessing that puzzle. It intrigues me. If you can be right more than half the time, you are successful. I would also say that I am successful because I *am* so eclectic. I am not a purist. I use different things at different times, because I think different tools work at tops, different ones work at bottoms, different ones work in the middle. I am constantly changing and I am adding other nontechnical things to the mix. In today's environment it is important to understand how the stock market environment has changed. These changes impact the technical tools you are using. We have a completely different trading structure now. I talked about the flow of funds, which is looking where money is invested and where it might go next. It's very important to understand which investor is driving the stock market. There have been times – it started in the mid-1960's and it went through the 1980's – where we had a huge growth in mutual fund assets and a tremendous increase in pension fund assets. This growth in managed fund assets is what drove the markets for most of that period. It was *before* the 1973-74 bear market that the average

investor began to leave equities and stepped to the sidelines. Simultaneously, the drivers of the stock market became what we call professionals. These professional money managers – pension funds, mutual funds, or independent advisors – acquired assets and made decisions that defined the market. In the 1990's it was the household sector again. I have always monitored mutual fund flows as a sample of demand much like everybody else. But my approach to those flows differed. Mutual fund managers were not the drivers of investment decisions in the 1990's; people who felt that mutual fund money managers were controlling the market were wrong. They were the conduits, not the decision makers. The public gave individual money managers the money. So I looked at mutual funds flows to see which *funds* acquired assets – it was technology funds. That's what drove the market. It set the tone of the market. It was obvious that the market would trade differently in the 1990's because it was driven by the public. In fact, it was the public's irrational exuberance that created the bubble. Professional money managers would not have been aggressively buying stocks when they were trading at 40 times earnings. But they *had* to. This was an important piece of information. Today, the asset class acquiring the most assets is hedge funds. Hedge funds are different from mutual fund managers or from the public. Since they are very short term oriented, they drive the market in different ways. There is a greater amount of noise in daily market action today; this is primarily generated by hedge fund money managers as they scramble to find absolute returns any way they can. They tend to "rent" stocks but not "invest" in them. With that in mind, we may need to measure the market and the major trend differently. As you can see I am not stuck to one kind of indicator.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

GD: I think I have a natural filter for "noise." First, I don't try to forecast every ten percent move in the market or in a stock. In today's market, to try to identify every ten percent move is suicidal. That's my personal opinion. I am sure some people can do it very successfully, but I cannot. So, I create filters to take out random noise and I am not attempting to get early signals. I only want *good* signals. For example, we talked about 90 percent days. We just recently had a 90 percent up-day which I believe was a result of Ronald Reagan's passing. The market had this big up-day, and when I saw it I said: 'Technically this is a signal, but it is not really market related; it is a special *tribute*, in my view.' *You can't chart this stuff*! Ronald Reagan was the first president to ever visit the New York Stock Exchange floor. The NYSE membership is a big fan of Ronald Reagan. In short, what happens on that floor – the supply and demand for stocks – has a strong emotional component. So I believe that the rally in the market that day was in Ronald Reagan's honor. And I said that in my written work that week, I realized I might have been wrong. I use quantitative things as well. For example, I use a version of Coppock's curve to do long-term strategy for sectors. I am attempting to define turning points. With this tool I use a filter of three months to avoid whipsaws. Momentum must be consistent for three months to confirm that a particular sector has indeed turned and is now in a bullish trend.

So I use different tools and different filters. I am trying to find investments, rather than day trades, and that makes it easier for me to filter out random noise.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

GD: I've seen people use it both ways very effectively. I don't think there is a right or wrong here. I believe that if I lived in a vacuum, with no news and only had technical analysis to work with, I could use it effectively. I choose not to, because I am not willing to give up information if I can get it.

J: How much of your technical analysis is done on an intuitive and subconscious level?

GD: It is hard to say. *It is unconscious.* I know there is a good portion of my work that is intuitive. My salesmen like to bet on things. For example, prior to a Fed meeting we might guess whether it will be a 25 basis point move, and if so, will the market go up or down? They love to do this. So we bet occasionally, but not for money, only for fun and/or ego. I win a good share of the bets. There is some instinct there. But it may only be unconscious thought process. When they ask me 'how did you know that?' I find that there *was* a series of bits of information that I put together to arrive at that conclusion. But the truth is, when it comes to making the bet, I just do it without thinking about *any* of these things at the time. Is that intuitive? I guess that is what intuition is. It's using tiny bits of information in this computer (*pointing to the head*) which spits out an answer before we realize what we are doing. I guess I am intuitive. I also find myself guessing which elevator is going to come when I push the button, so I know that I like intuitive guesswork.

J: What percentage of your analysis is intuitive?

GD: If I would have to put percentage on it, I would probably say ten percent. I believe I am very statistically driven. I really look at numbers. My clients need to have a clear explanation for my decisions and this is only possible through the data. They are making big decisions on huge amounts of money. They may believe in you, but they still need a statistical explanation of how you got there. Remember they may be managing someone's pension. So they need it and I provide it in my work.

5.8.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

GD: The most reliable indicator is the combination of price moves and volume. Again, I go back to basics and to my background which is economics and math. I believe that a chart is nothing more than a graphic description of supply and demand. Looking at price

movement and adding volume (volume constitutes conviction in the price movement), is one of the best tools. In today's environment the worst tools are the sentiment indicators. It's not that I don't believe in sentiment indicators, because I do. I just think that the world had changed in such a way that we don't have good sentiment indicators to look at. In the 1970's a great sentiment tool was the American Stock Exchange volume divided by the New York Stock Exchange volume. It was a proxy for activity in low-priced stocks versus high-priced stocks: speculative activity versus Blue Chip activity. Well, the American Stock Exchange has completely changed. It does not represent small capitalization stocks or small cap volume any more. You can't use NASDAQ volume (although I tried), because the NASDAQ is not all small cap volume. Given the trading taking place in puts, calls, and derivatives, there are many potential sources for sentiment indicators. But at the same time so much hedging is going on that it is not easy to measure real sentiment in these markets. There are surveys of sentiment, but if you study them, these surveys have huge flaws. Very often they are sampling different people every week. To me that's not a very good survey. So I don't believe there are good sentiment indicators today. This is a big hole in the technical arsenal. One new sentiment indicator is the one created by Ed Hyman (an economist) which is a survey of hedge funds. Again, because I am interested in hedge funds, I like having a measure of sentiment in this arena. This survey is one of the most interesting things I have seen in a long time.

J: How do you test patterns or indicators before you start using them in real trading? Do you ever ask for other people's opinion when you are making such decisions?

GD: There are so many different ways you can test. Right now I am working on a model which is nothing more than relative strength of industries within the S&P. Relative strength is a technical indicator, but what I am trying to do is numerically define relative strength of all 58 industries in the S&P 500 by looking at relative performance over a particular time frame, ranking them, and then trying to define an indicator. I ask myself: What defines a buy signal or a sell signal? Once we define a buy signal, what defines a completed buy signal? I gather all the numbers and all the performance data, and then I put forth my first theory. For example, I say: 'When it crosses this point, that will be a buy signal, then when it gets to that point, it will be a sell signal.' We then proceed with the testing. At the current time, we find we are giving up too much performance in the beginning, and are only catching the middle of a move. We need to do more work on this to make it a good indicator. These are the things I call quantitative. I take a concept, convert it into numbers, back-test it and try to see what defines a good signal. I do my own tests, rather than relying on someone else's.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

GD: In the last five or so years there have been many patterns in the indices, such as head and shoulders tops/bottoms or wedges, that haven't worked very well. Traditionally

these are excellent patterns. There are two things to say here. First, patterns that get a lot of attention, like the ones that I am talking about, are patterns in indices, or composites. The mistake people make is that a pattern is only effective if you can see the same pattern in the majority of the components within the index. If you see a head and shoulders top in the Dow, but not in the thirty components of the Dow, the odds of that pattern working out are slim to none. One should look at the components of the index; most people don't. That is the mistake. I think patterns tend to work pretty well with individual stocks, but less well with composite indices. I have also studied patterns in the bond market, since the bond market is a psychological trigger for stocks. I am frustrated with that right now, because I find that some patterns that work well with stocks do not work when applied elsewhere. For example, there is a four-year down-trend line that has been broken in the bond market. This is followed by a triangular pattern, but there is a whipsaw on the way down and now it looks like there is a whipsaw on the way up. It appears to be a real pattern but it is very frustrating to me as a technician because (I am convinced that) if the same pattern had occurred in a stock, it would have resolved itself and done beautifully already. This mammoth global Treasury bond market is different because the pattern has not "worked." I would relate this back to the fact that treasury bonds are impacted by a variety of political factors. It's not just pure supply and demand. It's supply and demand plus political ramifications, cross-border investment flows, the dollar, etc. This may explain why it is not working like one might expect. In other words, you can analyze patterns, but sometimes something bigger is at work. Right now what are bigger than the markets are Iraq, global politics, and the presidential election. All of this creates tremendous uncertainty, leading to a lack of follow through on many trends. Few investors – be it the public, the hedge funds, or mutual funds – are willing to take a defined stand for very long. The hedge funds will take a stand, but only for a day. That is what is different about this market. You see, the public makes a decision and tends to stick with it for months or years. The hedge funds stick with it for an hour. It has been a frustrating year and that is part of the reason.

J: Is the number of indicators you follow greater when your trades are larger?

GD: No. I don't know how many indicators I really look at per se. I am always dabbling over here, trying to find new ones. I'll bring them into my work; see if they work, and if they don't, they go out. I maintain a pretty dynamic pool of indicators without any particular number. But when I get confused by my indicators (which can happen a lot) I go to individual stocks and I look at stock patterns. I go back to basics. That is what helps me come to a conclusion on the overall market and/or on individual stocks or sectors.

5.8.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

GD: So much has changed. I already talked about the sentiment indicators. There are

sentiment indicators which could be very effective, but that area is less effective now because of changes in the markets or markets that disappeared. Sentiment can be measured in some other areas. For example, the options market seems to be a place to look at sentiment; but now there is so much hedging taking place that you cannot be sure what real sentiment is when you look at option premiums and volumes. I've been around a long time. When I got into the business in the 1970's, it was the end of the cycle of the average investor impacting the market. There was a shift and the market became professionally driven. Then came the 1990's and again, the market was driven by the public. Now I sense that we are going into new cycle where the market will be driven by professionals. These are important shifts. As technicians, we have to be alert to the fact that the actual execution of a trade has changed. Trading used to be done either on the NYSE/ASE or the over the counter market; today volume is found on NASDAQ, multiple ECN's, 24 hour trading globally and on upstairs desks that never hit the system. One offshoot of this change is that we can *no longer* define volume. If we are talking about an NYSE stock, volume could be defined as exchange-only volume, exchange plus after-hours volume, or it could be composite volume. If I am trying to get one consistent series of volumes on 500 stocks it can be a nightmare. For each individual stock, I have three different sets of volumes and three different numbers. Why? The trading structure has changed. Trading no longer starts at 9:30 on the New York Stock Exchange and ends at 4:00. I began by saying that volume is a very important ingredient to me since it is a measure of conviction. I believe this is true yet we have many different volume numbers to choose from. Which is the most accurate measure of conviction? Volume definition has become quite a chore for me. Thirty years ago the market structure was simple and we did not have these questions. I don't know how many people actually think about this, but when I am buying a volume series, I have too many choices to make. I have to ask myself if after-hours trading is relevant to my project because a different kind of trader is involved there. Is using only the NYSE volume good enough, or do I really want composite volume? Then I ask myself, 'how about ECN volume?' Some trading takes place today that is not measured, and we never see or hear about it. Since the charts are looking at price and volume I think these choices are important. Business is more complicated than it used to be and it can be a puzzle sometimes. I go back to the fact that you become a better analyst if you understand the numbers you are working with. You can come to a wrong conclusion if you do not realize that you chose the volume series that doesn't relate to your study. I'll give you a perfect example. I return to 90 percent days. It is a simple concept. It is measured as the volume in stocks that advanced for the day divided by total volume and the volume of stock declining as percent of total volume. Our data vendor is Reuters, but Reuters excludes stocks priced below 5 dollars in their NYSE volume figures. We lose that information. Is that important? It is if you want to include Lucent or Nortel in your data. We therefore maintain another set of volumes for them. Another vendor provides advancing volume and declining volume on the NYSE. We thought this could be a good alternative until we looked at their total volume figure. Their total volume is composite volume and their up-down volume is exchange-only volume. You can't do a 90 percent day on those two data series because it is apples and oranges, yet that is all they have available. How do you create a

90 percent day? I am not sure how many people actually dig into the numbers like I do, but I believe you *must* understand your data in order to make good decisions. I believe it is better to use a smaller number of indicators, use them really well and really understand them.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions?

GD: I do. But I find that most of the new inventions in technical analysis have evolved from the futures markets and they are very short term oriented. I am thinking of things like RSI and TSI (to some people these might be ancient, to me they are new). I look at them, but I don't put much emphasis on them. My clients invest a lot of money and it takes a long time for them to move in and out of a position. They are not day traders and they are not looking to make short term moves. This is not to say that I do not talk to hedge funds. When they ask me day-trading type questions, I answer. But I am very clear to them that I am not focused on day trading nor do I plan to be. I stick to the things that are far more strategic, so I look for inventions in the strategic area. I may be missing them. If you come across the new ones, send them my way, I'll always look at something new.

J: Do you study the new inventions just to know what others might be doing, or do you also update your own strategies as the field evolves?

GD: I look at everything and I am very interested in everything. I have not personally seen anything terribly creative recently however. I've seen variations of a theme, and I've tried them, but then I always go back to basics. For example, I follow RSI – these are nothing more than overbought-oversold oscillators based on price and volume and the combination thereof. I prefer to use my old overbought-oversold oscillators – the ones I inherited when I started doing Peter Ruggles' charts. These are 25-day nets. They talk to me. I see no reason to add the RSI indicators since what they do is cut off the extreme readings at the top and the bottom of the oscillator. That's what they do, they cut them off! So I go back to my old basic oscillators because I love to find those extreme readings. I want to see how extreme it goes. I want to see if it's an all-time overbought reading or not. The new creations are nice but I don't maintain them and I don't focus on them, but I look at them from time to time. In most of the cases when I look at something new, I find it is just a variation of something old. It was some old indicator tweaked in a different way. Sometimes those tweakings can be good but most of the time they don't add much. I don't see big advancements in the craft so I stay with my regular indicators. There is an area where I would be interested in new tweakings. The way the New York Stock Exchange has changed, the data from there (up-down volume, advance-declines, new highs-lows) has also changed. Our old indicators are not the same. For example, many closed-end funds are fixed income oriented and trade as stocks on the New York Stock Exchange. These are not "stocks" yet they are advancing and declining, they are adding or subtracting to the volume. So if I were going to tweak some old indicator, it would be to make that old indicator better, more refined, and more

suitable for the current environment. Those things interest me, but taking an old indicator and making it more short-term oriented, does not interest me. I am not short-term oriented.

J: To what extent has the introduction of the variety of computer software aided the craft?

GD: It's been great. I am such a dinosaur – I used to keep my indicators on spreadsheets. I did all the numbers – I think it only took me about 25 minutes to do all these calculations – and I had all my hand-drawn charts up on the wall. They unfortunately got lost in one of my moves. But I remember how people used to love to come to see my charts up on the wall (in a long hallway). It was nothing like some chartrooms, but it was my personal wall and it was great. It was also time consuming. Now all my numbers and all my data are in excel spreadsheets and I can link the files to each other and quickly update everything. Charts come up in an instant and there you go. The ability to add or delete indicators and back-test them is really wonderful. On the other hand, having been part of the old generation, I can tell you that you lose touch by having everything computerized. When I was plugging in the numbers into a spreadsheet myself every day, I would get a feel for the market that was much deeper. Now I probably have more indicators and do more stuff. At the same time the responsibilities of my job have become much greater and more numerous. So if you consider all of this, I would not be able to do all my indicators if I did not have a computer. It is less personal but it is faster.

J: Do the advantages outweigh the disadvantages?

GD: I would say they do. One of the biggest disadvantages (and I am not sure that people actually get this, though maybe Ralph Acampora and Alan Shaw could address it) is that we can put all kinds of charts on our computers, print them out, draw and analyze trend lines, and yet if you compare these computer charts to hand drawn charts, the trend lines do not match. No printer in the world that can be as precise as a piece of graph paper. That is something I learned a long time ago. It's a simple thought, but I don't know how many people have worked through it. I did, because I had my wall charts, that is to say my hand charts and I had my computer charts – I would draw trend lines on both. They were different. A computer printer is simply not that precise. As a result, I give myself a little more leeway on my analysis of computer trend lines – a margin of error you could say – because I know they are not that exact.

J: How different were they?

GD: It's not a lot. You'd be off by half a point, three quarters of a point, or a couple of points, but if you are using that dollar number as a trigger level for a reversal, it can matter. Like any indicator or any tool that you use, to use it well it is important to understand its limitations.

J: To what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

GD: I rely on very few computer generated signals. I am assuming – and correct me if I am wrong – that what you mean by a computer generated signal is that you've come up some kind of formula and this generates a signal. So, it is some kind of quantitative formula, or black box, that you are talking about.

J: Yes, but it does not have to be a formula of your own invention; it can be any program which tells you where to buy or sell.

GD: There are different thing that I would use and others that I wouldn't use. I am trying to think of another example. I don't consider overbought-oversold indicators as computer generated signals whereas another person might. I don't use Bollinger bands, though I could. I understand them, and I think they are very interesting because they are talking about different kinds of overbought-oversold situations. They, too, could be considered computer generated signals. Those are things that I could and would use, but I would never rely purely on one computer generated formula. The market is a summation of all investors' thoughts on the market. Price and volume are very, very important, but I don't think we are able to quantify them to the extent that we can really create a model that would work in all circumstances. I always put my overlay on it and do not rely just on computer generated signals. The best example of a computer generated model that went wrong is Long Term Capital Management. Too often a model is based upon regression to the mean. As I once said once to a group of MBA students: the actual *mean* occurs perhaps once (for a nanosecond) every ten years. If you are relying on the mean to take place you can be wrong for a long time. With this as an explanation you can see why I do not rely on these things. I would, however, rely on a model if it were a combination of what I think are the ten most important indicators at that time. If they all worked in the same way it would be a good signal. This is in fact how I work, except I don't have a black box. It's all in my head. I look at what I think is most relevant at the time, put all those pieces together, and then come to a judgment. I always allow my judgment to override my indicators if I believe that's necessary.

J: Has the introduction of the software that has made it easy to rely purely on computer generated signals caused more problems than advantages?

GD: Good question. I would say that it has created some problems. Ten or fifteen years ago there was at least one quantitative analyst in every single brokerage firm. There would be a strategist, a technician, a quant, and an economist. There are few if any quants left at most brokerage firms. Why? They created brilliant models that analyzed the past to predict the future. Now to be honest, that is what all of us – technicians, fundamentalists, and economists – do, analyze the past to predict the future. But too often they built brilliant models without any understanding of how the data could be different today than it was

twenty years ago. There was no big, global understanding of what drove the markets that they were analyzing. In my opinion, a quantitative model needs some kind of judgmental overlay to make it work. That overlay is a seasoned analyst. So, thank God, I don't think we've become replaceable yet. We are the biggest asset to a quantitative model. These quantitative models are fantastic *tools*, but they are tools that do not always have the answer. They can direct you toward the answer, as long as you understand the weaknesses of your model. You have to understand how today's data inputs differ from the data used in that model's creation twenty years ago. If you understand all this, then you can work that model very successfully. Otherwise you will end up hitting a wall and the model will just blow up. Why do they blow up? Because people who use them do not know what the models really are. They do not anticipate what might happen to change the model down the road.

J: You mentioned how brokerage firms have eliminated their quants. Are they suffering as a result, given that a human opinion is needed as an overlay to the computer generated signal?

GD: No. I think too few, if any quants actually made clients money. One, Rich Bernstein, who is still very much a quant, is now the chief strategist at Merrill Lynch. He obviously has been successful for clients. But I cannot think of another. I went from the technical side to become a strategist; he went from the quant side to become a strategist. But in fact, much like me Rich uses everything in his analysis. 'Quant' is his basis, but it's not his only tool.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

GD: Yes. If I could, I would do them all by hand for two reasons. First of all, you are living through the whole day as you plot a chart by hand. You evolve with the chart. You understand the trend better than anyone. Secondly, your chart is going to be more precise if it's done on graph paper as I mentioned. The printer is not nearly as exact as graph paper. Notice, for starters, that computers do not print out charts on graph paper. Graph paper would probably make the inexact quality of computerized charts too striking!

J: Do you still keep some charts by hand?

GD: No, I have no time to do that. For me personally the gain of keeping the charts by hand is not large enough to offset the time involved. There are too many things that have now become a part of my job. I don't have the time to keep my charts by hand; it's too big of a luxury.

J: Would your analysis be any different if you were to do that?

GD: Well, I don't know. I might be a better technician if I did that because I would

be closer to everything. If were honest about it, we would probably say that we all loved the old days better. Some of the people that you might be interviewing who have been around for a long time and who now have their own businesses, have the luxury of doing hand made charts. Their time is more their own and they spend it where they see it best used. But when you are in a big organization where you have calls, meetings, trips, media and management obligations, you need to find the most efficient way to get the most out of your indicators and still get everything done. For me, the computer is the most efficient way. I can work with that "handicap," because I understand it. I know I would be better off if I did charts by hand. But if I find the market to be at a critical juncture, I try to just cancel the meeting, close the door, look at the charts, look at the numbers, and make sure I fill in that gap.

5.8.5 The innovative process

J: What drives your innovative process?

GD: I don't have time to be innovative *enough*, but I think what drives the process are my clients who need to make money in certain ways. They are not individual investors. They are money managers and they have special requirements. It used to be that whatever analysis I gave them was fine. As their jobs changed they needed to beat a benchmark, i.e. to outperform the S&P. So I became innovative in trying to find ways to outperform the S&P index. My need and desire to innovate relates directly to my clients' needs. I change my process to help them and to answer the questions I get from them. My most recent analysis is related to ETFs. ETFs have become a shortcut for investing in segments of the market, so I started to look at ETFs. So, in short, my innovative process is driven by the clients.

J: Do you and to what extent collaborate with others during the innovative process?

GD: Nice question, but I don't have anyone to collaborate with. I do not work entirely alone, but my current assistant has only been in the business a year. He began his career in fixed income, so I am actually teaching him about stocks. I have a small group – they are all very bright people – and we get together every week and talk about the market, what I am doing or what I am thinking about. We do collaborate a little bit, but I am still the driver of it all.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

GD: Charts are showing you current supply and demand; but if that's not helping me I step back and look at the longer-term, bigger picture. As I said earlier technical analysis is less effective in the middle of a cycle. So when we are in the middle of a cycle I start to look

at other things such as the Flow of Funds – where money is currently invested and where it is likely to go. Flow of Funds helps to differentiate whether we are in the middle of a long bull market or closing in on the end of the bull cycle. In the middle of a cycle everything is in an uptrend and everything looks good. Another thing about the mid-cycle, it is boring to write about because nothing new is happening. This is often the spark for creativity.

J: So in the middle of the cycle, relying on classical patterns and indicators is simply insufficient, and something new is needed at that point in time?

GD: Well, I would say something new is needed for me, but maybe because of my clients. When the needs of my clients change, I change. Technical analysis can work well because you can just buy and hold through the middle of the cycle. So it's not that the classical tools are insufficient, they are just rather boring. I guess it is more a problem because it is more difficult to be value added and to find topics to write about when things just stay the same.

J: Do you do better by adding something new?

GD: The reason I need "new" is because I write every week. And writing every week when there isn't something new to add, there isn't a new development, a change in market leadership, or a change in trend, nothing much going on, is hard. So, I look for new things because I am looking for something interesting to study, analyze, and write about. Sometimes I think I am innovative because I am bored. By adding new tools I am able to see changes in the market and to put an old pattern into a bigger context.

J: How soon after you develop a particular technical tool do you make it accessible to public?

GD: Once I believe it is a good indicator, I start using it. I don't keep a good indicator to myself; I include it in my work. But I don't incorporate it until I feel I can define it and explain it and show how it has worked in the past.

J: Why do you share your inventions with others, rather than keeping the edge just for yourself?

GD: Because it's my bread and butter. I write for my clients and my clients are my business partners. If I was at home trading my own account and that were my source of income, it might be a different story. But in my business I write, and I am paid for my ability to discuss the market and be different, creative, innovative, or correct. Hiding it does not have any interest to me.

J: So, am I correct to say that there are no tools that you developed but never shared with

the rest of the world?

GD: Yes.

J: How often do you use the technical tools you developed?

GD: I look at them every day. I am always monitoring and using them.

5.8.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

GD: When I think about the first trades I made and lost money, I recall it was painful. Luckily it was not a lot of money. Certainly relatively it wasn't. But it was painful because I felt so stupid. Also, it was difficult to figure out why I was wrong. But, of course, I was young and was trying to figure out the "whole" market. Many of the other people you are interviewing for this study may be money managers, managing other people's money or primarily their own money. I write a market letter that's public. It's a very visible view. Some people can get my view by reading newspapers. Being wrong may not necessarily be financially destructive, but it is embarrassing. *You* can judge whether that is better or worse. It always feels bad. As I've gained experience, my losses have been cut sooner, and financially I haven't suffered big losses. Secondly, the embarrassment of being wrong is something I've learned to step up to, admit, analyze, explain, and move ahead. It's much easier to lose now, no matter how painful it is. And as they say, the most successful people are the ones who make the most mistakes. It's a great thing to keep in mind. I tell this to my son all the time, who tries to be a perfectionist like I am. You have to be out there, doing it and making mistakes all the time. The important thing is to learn with each mistake so that you don't make it again. The market is always changing, so you are bound to make mistakes, probably different ones each time. But if you find yourself making the same mistake three times in a row, you are in big trouble. I think that's the important thing to keep in mind.

J: Has a big loss ever made you doubt the validity of technical analysis?

GD: Yes. When you have a big a loss, there are always doubts. My biggest public mistake was being bearish on the market too early during the late 1990's bubble. In the bubble nothing worked for me. Technical stuff didn't work, fundamental stuff didn't work. I had read Kindleberger's *Manias, Panics, and Crashes*, and actually mailed the book to our clients in March of 1999. I knew I could be wrong for a while by being bearish in a bubble, but I was willing to accept that knowing that a bubble typically lasts one to two years. Our bubble lasted three years, so the last year was very painful and potentially career busting. I will say however, that I believed in myself and financially I did well in a long run. But did

the extra year make me doubt myself? Yes. The first three months of 2000 is the period that I will never forget. I truly questioned whether it was a "new era." Was the world that far out of synch from what I believed was the reality – a bubble about to burst? You can read or study about mania but it is not the same as living through mania. The early stages of the bubble followed Kindleberger's book perfectly. My economics background was terrific guidance. I did a lot of Flow of Funds work so I could see the money was just cascading in from everywhere. But even after we apparently ran through all of household savings, all the pension fund cash and after every investable dollar was invested in equities, it just kept going. In retrospect it was classic "Kindleberger." People borrowed money from their homes, from their margin accounts, and just like Kindleberger said, there were new forms of credit created. Day-trading firms created a new (and it also turned out illegal) form of margin account. Day-trading firms created margin accounts but these borrowings were not reported in NYSE or NASD margin debt reports. So money was found in every corner and crevasse and this kept the bubble going much longer than I would have guessed. So, yes, I doubted the validity of my analysis at that time.

J: You doubted the validity of technical analysis?

GD: Everything. The AD line had topped out in March of 1998 and in March of 2000 the market still seemed to be going higher. The longer the divergence lasts, the greater the bear market. But in early 2000 it seemed like nothing worked. It was a very challenging three-month period.

J: Did you doubt the validity of technical analysis more than you doubted the validity of other things?

GD: Oh no, I doubted everything equally, and it was mostly because it was the biggest bubble that ever materialized. It was bigger than anything I ever lived through.

J: But the doubts were not so great to make you give up on these things?

GD: No, I invested based on my beliefs and it worked out pretty well.

J: How is the way you apply technical analysis different when you are more cautious compared to when you are less cautious?

GD: It's a tough question. I would say that I am on the cautious side all the time. I tend to be a conservative long-term investor and not the day-trading short-term type. So I believe I use technical analysis the same way all the time. Once I retire I do plan on trading my own account; it will be fun to see if I become more short-term (less cautious) oriented then. I think I can probably do both, but not at the same time. Today I am willing to take more risk if I believe strongly that something is going to happen. Sometimes an indicator or a chart pattern is not definitive. You make or suggest a short-term trade, but the truth

is, your conviction is not great so you may not follow through. Is that being conservative? I don't think so. I am willing to take risk only when my belief is strong. And it depends upon your goal. Some people are looking for a trade every day. In my case, I may get no more than ten signals a year. Because I've analyzed the historical data, I usually feel strongly that out of those ten signals, seven are going to work well. But when I get a signal I ask myself: 'How do I feel about it? Is it a very good signal?' If something tells me yes, I will be willing to take more risk. If it's a not-so-convincing signal – when put into the context of a lot of other bits of information – then I won't take the risk. One should pick one's shots. You have to know how to *selectively* take on risk.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

GD: Good question. I'd love to see how other people answer this question. I think our emotions are often our biggest handicap. This is why quantitative or technical analysis is a tremendous discipline. In both cases numbers are pushing you in some direction. What I love about technical analysis is that it will tell you whether you are right or wrong fairly quickly. You cannot stay wrong forever. At some point you have to say: 'OK that was wrong.' Technical analysis has a discipline to it. I trained in a vacuum of opinions so I am very independent in my thought process. I can distinguish between situations where I want something to happen versus what is the likely event. When I want something to happen, I am aware of my bias and that's very important. I believe I am good at separating my emotions from the signals. We all have a lot invested in our market calls. When you write on the market your reputation is on the line; you have a lot invested in it and you really want your view to happen. But I think I am able to control the emotional side of forecasting.

J: Were you always like that, since the beginning?

GD: In the beginning I had less confidence in my calls. You begin with a collection of indicators and a strategy and you say 'this is what I think.' You go through the process of being right or wrong as well as the process of dealing with those successes or mistakes. How you deal with your successes is just as important as how you deal with your failures. There are too many strategists or forecasters who have a good string of calls and then start to believe so much in their own omnipotence that they cannot see when they are about to fail. It's very important to control both positive and negative emotions. Don't get a big head when you are right for a long time and don't get too depressed when you are wrong. Again, I don't really think people expect you to be right all the time. If they do, it is a foolish thought and that's not your problem. But you must try not to get into emotional traps that can fog your mind. This may be one of the most difficult things to accomplish.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

GD: I think it can be learned. It may be easier for some people than for others. It begins with a desire and the ability to know oneself. Second, you must think – ahead of time – and define what it means to be wrong in a particular situation. Everybody can do this. If you are an average investor and you are considering buying a stock, you would be wise to think about what would define your position as "wrong." Decide this before you even buy a stock. Then if the scenario takes place, the emotional content is removed from the equation, you'll sell, and you won't lose as much money as you might otherwise. The same is true with professionals. If they think out scenarios ahead of time, set some parameters, they won't be caught up in the emotions that might lead them to make excuses and mistakes. They won't be caught up in thinking: 'the stock is down ten percent, but it's even cheaper now', or 'it's a whipsaw,' or 'the volume is low so it does not matter,' etc.

J: Do you think that there are people who, no matter how much advance planning they do, just cannot conquer their emotions and reverse their positions when the time comes?

GD: Yes, I think there are people who are like that. Professionals who have been in the business for a long time are successful because they have dealt with their emotions fairly successfully. They are less likely to fall into traps; though every once in a while you will see professionals succumbing to their emotions. Everyone is human. It can happen for them in different ways; it can be related to a stock, a market call, or anything they have a lot vested in.

J: Has it happened to you?

GD: Yes, it happened to me early on. I bought a stock because of a technical pattern, made some money, and fell in love with this stock. The stock was Occidental Petroleum. I bought it right, held it, and I remember telling people, 'I am never going to sell this stock.' And, sure enough, I kept my word and did NOT sell the stock until the price round-tripped up and back down. It was a very stupid thing to say and do, but I learned a lot. I bought the stock for my family; I made them money. It was great, but I didn't get them out early enough. Why? Because I've made the mistake of thinking, 'this is a great stock; it's going to go up forever.' I became attached to the stock. I learned many lessons early on. I don't know if separating my emotions from my analysis was at the center of my personality. You are the one who is going to judge that after talking to all of us, analyzing our differences, and seeing if there are certain attributes that make you a better technician.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[13]*." To what extent is this statement true in your case?*

[13]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

GD: Speculator is an interesting word, because it has a bit of gamble – going for the big win – inherent in it. While I certainly have felt that way at times, I don't have a speculator mentality. I don't gamble, for example. I go to Las Vegas, but I don't enjoy playing games with my money because I don't understand the game and consequently I cannot win. I only speculate on things that I understand, that is to say, on things where I have an advantage so that I can win. Moreover, if I am not winning, I get out and figure out why not. Maybe I am not winning because there is something I don't know, or maybe I made a bad judgment. I do not see that "battle" in me that this quote refers to and which I equate with gambling. On the other hand what I do for a living suggests that there is a form of daily battle that takes place. But because I am so regulated and I travel extensively and can be away from the office (and our compliance officer) frequently, I do not have the ability nor the luxury of trading my portfolio daily. (I buy real estate, which is a long-term judgment. I do this when I feel I know the value of the "location"). On the other hand, I had a recent situation where I owned company options and had a specific time frame in which to sell them. Because of the limited time frame, I challenged myself every single day as to whether or not this was the day to sell. There was a price point below which the options weren't worth anything. Above the price point they were worth something. So I had a strike price and a time frame in which these options would expire worthless or make some money. I used technical analysis exclusively. I looked at the volume and the price, I understood the stock and what was driving it. Understanding that there were a lot of options expiring at the same time and that their expiration was going to depress the price, I said to myself: 'I need to shorten my timeframe.' I did have the daily "emotional battle" but in the end I executed the options and made some money. When I look back, this execution was about as good as I could have done. In any case, I've had those battles, but I understood the market as good as most and better than some. I knew that if I was struggling to execute these options, so were many other people. So I narrowed my timeframe in order not to battle other people in the last few days before expiration. I was going to execute within a timeframe that I chose. I was not going to be greedy – that's a battle of the uninitiated. I fought the greed part and just said to myself: 'Make *some* money. You have an option here that will either lose money or make money.' When I saw it making money for a couple of days (after being wobbling for a while) I executed. So I guess I do have a love of the battle. But I reduce the internal battle within.

J: So these mini-battles prompt you to take your analysis to an even deeper level?

GD: Yes. I always look at the bigger picture rather than just a single chart. The story I just told you is a good example of how the charts help me. But if I had only looked at the chart, I would have been misled. There were days when the price went above the strike price – it moved way up – looking almost like a breakout. However, I understood the bigger picture: there was going to be selling pressure from me and a whole lot of other people within a well-defined timeframe. I knew that what seemed like a breakout was not necessarily a move straight to higher highs. I was adding other information to it.

J: Do these mini-battles take place for you on a daily basis or rarely?

GD: Rarely. But, you know, it's interesting because the story I just told you was related only to my personal portfolio. And I don't trade my personal portfolio often. But this particular instance is more relevant for what you are asking about.

5.8.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

GD: Can energy be created or destroyed? No, I don't think so. The craft and the discipline parts of technical analysis clearly can be taught and learned but then there is the creative part. It is like the icing on a cake. In my experience, I've met people who have been creative and those who haven't. I've had many assistants working for me. Few of them have it; a few have. What is creativity? You can't really describe it. It's like singing on key - some people can do it, others can't. Why? We don't know. I don't think we know where creativity comes from, though we are all creative in some way. But it may not be in technical analysis. So, to answer your question, I don't know if creativity in technical analysis can be learned.

J: Is it important to have it?

GD: I think it's very useful.

J: So it manifests itself in different ways in different people?

GD: I think so.

J: How does it manifest itself in your case?

GD: I am a visual rather than an audible learner. That is how I analyze everything. Charts are the way I see things. I have taught myself to understand columns of numbers, but columns of numbers don't really speak to me. Accounting, which I've taken, doesn't really speak to me the way charts do even though charts are nothing more than numbers in picture form. I am primarily visual, so I see activity in charts and I understand the numbers more easily that way. Often my assistant will come to me with a chart, and I'll look at it and immediately say, 'well, that is wrong.' Usually it turns out that the data has been input incorrectly. Charts are a wonderful shortcut for assimilating a whole lot of information very quickly. I solve problems visually and that's how I create new models, too. I can't explain how and why, but that's what works for me.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

GD: I think there is such a thing. When I came into the business there were fascinating traders called tape readers. This refers to the days when there was the ticker tape machine in every office that printed out the tape that you see now on the bottom of the screen on CNBC. In my office, there were many wonderful gentlemen who would come by to read that tape, watch the prices go by and tell you all sorts of things about the market. These were very talented people who understood many things about the market and its environment. Now it is a different environment and there are still some people who look at computer printouts and can do something similar – neuvo-tape-readers. Some are really talented; others can look at all the numbers, draw the lines, come to very good decisions, but they're not quite as good. How do you explain it? I don't know, but I see it. Some people just are more creative. It's much like artists. Some are better than others. Of course, many might challenge my view of art. Who defines art? Which is better, modern art or the Dutch masters? We all have different perspectives.

J: Can the absence of talent or favorable personal traits be overcome by hard work and dedication?

GD: I think so. We are now talking about talent, whereas before we talked about creativity. Creative people find indicators where none existed before. But other people learn by rote, make mistakes, learn from them, look at millions of stocks, and do it over and over again until they get better. With a lot of hard work, you can become a good technician and develop this talent. Most of technical analysis is really simple. I am teaching my salesmen about technical analysis all the time. They'll say, 'God, I thought I knew about that' or 'I didn't know that.' They love it. They use tools to help them draw trend lines, determine what is a true breakout, watch volume as it moves with price – you know, basics. Moreover, there are people who think they do technical analysis, but who haven't actually learned all of the rules or the tools. I would say some technicians are not bad, but they are not really using the tools available, so it is like working with half a deck. Only with time, through acquiring new tools and seeing how these tools work, can you get better and better.

J: Are there people who cannot learn no matter how hard they try?

GD: Good question. Maybe a way of looking at this question is by thinking about how most traders on a large institutional trading desk end up being technicians – or amateur technicians. They live in a world of price and volume and look at charts of price and volume a lot. They live it and breathe it. Are the traders that do well and survive gifted? Are those who work on a desk but can't take it after a year or two and leave not gifted? By sitting on a desk and being exposed to tons of information and learning day after day, you *can* become quite good. There are two dividing lines. The first line divides those who do *not* get it and can't take the pressure of a trading desk. Not everybody can. Then there

are those who can take the pressure and do learn. These traders often become very, very talented and very, very successful. The same can be true of technical analysts. But I would point out that some technicians should get honorable mention because they are truly special and creative. These are the pioneers who, may not have sat in the middle of a trading desk or amid the chaos of the markets but, developed new ideas. Some people from our past, like Edson Gould, were creative and special. So there are these three kinds of technicians, and I am not saying that one kind is better than the others; they are just different. I know there will always be this question about science versus art of technical analysis. I think you can do extremely well on the science part and be very successful as long as you understand the bigger picture in which you are working. To go beyond that, you need some art. But the art part of technical analysis is hard to pinpoint exactly. The same is true in math, too. You can call it a science, but there are mathematicians who are truly gifted and creative. What is it that they have? I don't know, but they, like Einstein, are in a different echelon.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

GD: No. I think it will be close, but I don't think it will ever be perfect. The next question is, why? An easy way to answer this is that you can put a vast amount of technical knowledge into a model and into numbers. As technicians we are dealing with a steady string of decisions that can be quantified numerically. But there is another part of the analysis where you should put the chart or indicator into a bigger context. Why? Because the event you are watching may have a certain meaning today that is different from what it meant historically. The model is based on an historical perspective, not on today. You need to ask yourself: How has today's environment changed and what effect does that have on the price move under consideration? How is its interpretation different today than it was ten years ago? Changes in the environment and how this impacts technical interpretation are difficult things to model. No, people can't be replaced totally. It's the human nature behind the data that is most important. It takes a lot of people deciding unilaterally and in unison to buy or to sell stocks that generate the numbers we study. That in itself is information. We try to understand why the crowd made the decision it did and to factor that into our analysis. Computers can't answer why. They can tell you whether this pattern ever happened in the past and when it did what usually followed. But the past environment is different from that of today. I don't think you can program a computer to adjust itself to an environment it has never seen and still produce accurate results. If we get that part, then we can all be robots.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

GD: I think technical analysis is both an art and a science. I know most people would say it's either an art or a science and not both, but I think it's both. Let me follow up on my

previous answer where I said that a lot of technical analysis is a steady string of information that is interpreted in certain way. There are rules which can be quantified; therefore it is a science. To some extent, technical analysis is as much a science as psychology is a science since what we are studying is the psychology of investors. It is the psychology of investors, when put into action, which creates supply and demand. What we are reading in the charts is supply and demand. But a part of it is art and that part can't be quantified. Similarly, psychology – the analysis of "people" – is a science, but it is also an art. Let's say you are a psychiatrist and you have a model for certain types of personalities. Suppose a person comes into your office and you are trying to help them. You can't just blindly apply the "model" of that personality type to help this unknown person that walked into your office. Although he/she may have a clear personality type, they are also an individual. I would think you would customize your model to fit them if you are a good psychiatrist. In the same way one needs to customize one's interpretation of the market to this *particular* market, to be good. First you should learn everything you can about this market, before you customize your analysis. This is where art begins.

J: Is it more science or more art or equal part art and science?

GD: I guess I would say equal part art and science, but I lean a bit toward science. However, I have seen people who say they are technicians but they do not even have the science part right. That frustrates me sometimes, but I may be nit picking. I think it happens because many of our *rules* are open to interpretation. I talked earlier about the fact that there are *too many* ways to define volume today. Similarly, there are *too many* ways of drawing a trend line. How do you draw a trend line? You can draw it using intraday lows or closing price lows. This is open to interpretation. There are intraday lows, daily lows, weekly low and monthly lows. Nonetheless, there is a science part to it which I love. This is where the discipline resides. At some point you will have to say, 'hey, I was wrong,' and you will get out. I love that part. But other parts of technical analysis are not well defined. There are not any books written on the topic.

J: Is there literature on the art side of it?

GD: No, I don't see anything on the art side of it. The closest thing I have seen are books by traders who tell you what has worked for them or how they traded successfully.

J: So treating is treating technical analysis as 100 percent science is just not right?

GD: Well, I don't think there is right or wrong here. As long as you understand what you are doing, you can invest successfully using technical analysis, fundamental analysis, or quantitative analysis.

J: So someone who is using it as 100 percent science could theoretically be just as suc-

cessful as someone who is using it as part art, part science?

GD: I think that someone who is using it as pure science might not make as much money as someone who combines science and art. So I don't think they would be *as* successful, especially in today's market, dominated by hedge funds going for short term gains. The potential for false signals is greater. If you had a purely scientific approach, you would be frustrated and/or potentially lose a lot of money. Without an understanding of the bigger picture you would be prone to chasing signals that do not have any follow-thorough. It is the bigger picture that I consider the art part.

J: Earlier when we were talking you told me about your interest in art, and I was wondering how does this artistic aspect of your personality reflect itself in your technical analysis?

GD: In my senior year in college I took a several studio art classes. My professors thought I was a freshman art major which was quite flattering. I was pleased that I seemed good enough to *major* in art. But I was an economics major. Like many parents, mine felt that art was not a career. Maybe this explains why I think technical analysis is an art. I learn visually and I am a visual person. I like the arts. I have painted and drawn. My eye for pictures helps me to read charts. I would not be able to defend this statement, yet I know I am a visual person. I cannot memorize names unless people are wearing name tags. I need to see a name with each face; if I just hear it, I can't remember it. So I think that my artistic side does help somehow. And we also talked about psychology. Is psychology an art or a science? I think it's a little bit of both. I took psychology in college, and that, too, has helped me analyze the stock market as much as my economic classes. Understanding human nature is a huge asset in understanding markets. I would say that psychology also belongs in the "art" part of technical analysis.

5.8.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

GD: I don't know, but I think it does play a role. If all the indicators line up on one side of the road, it's fairly easy to decide whether the trend is bullish or bearish. Assume you are in a bear market. The market is down twenty percent; it has been down all year. With this as background you know that the odds are in favor of a bullish turn at some point. When many of your indicators move into line as well, you can make an intelligent and timely decision to be bullish based on experience and science. BUT when markets are more neutral or mixed and most indicators appear to be in the middle of the road, it is far more difficult to analyze and predict the market or stocks. However, you may see something subtle in your indicators or in stocks which, in your opinion, might be the *beginning* of a trend. Suppose because of these subtleties you make a call to buy a stock. It is possible for the market to turn around the next day and the stock to go up, because – as you correctly recognized –

the environment is very mixed. *But in this particular case*, you might feel there was luck in your call because the path of the market was not clear. We talked earlier about reading grey areas and being selective in your judgment, or your calls. You could look at a chart and say: 'what are the odds of this being the beginning of a new trend?' You know full well that the odds are only slightly in favor of a new trend beginning, but you must decide whether or not to make the call. If you are right is it luck or science or judgment or creativity? Sometimes you just feel lucky. So I think there is some luck. But I would like to underscore that you create your luck in this career because you are making intelligent decisions. You make decisions to take risk knowing what your odds are. So you do create your own luck.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

GD: That's a loaded question. I would be willing to look at anything if it made me money. But I have not been personally successful in using astrology to analyze the market. Still, once a year I enjoy receiving a report that uses the Chinese lunar calendar and Chinese astrology to predict the Hong Kong market. I think all these things are fascinating. I know that for more than half of the population relating astrology to technical analysis is not seen as a positive. Many people relate astrology to the 'Read your fortune for 5 dollars' sign that they see as they walk down 36th Street. The technicians who do use astrology are really looking at the scientific aspects of astrology and include technical indicators to come to their decisions. I am not going to put it down. The fact that I do not use it does not mean others cannot be successful using it. I don't put down something that I haven't tried myself. But astrology forecasters do not help our image.

J: Is there a reason why you haven't tried it?

GD: I've tried different things at different times. I've tried Elliott Wave and Gann. They confuse me. I do not connect to it; it doesn't work for me. Yet, I see other people using it successfully. I see successful people using a variety of tools. You simply have to stay with what works for you. In the current era we are analyzing so many variables and using so many bits of data and information that I believe much of it is truly noise. Computers are a big part of this change. At some point you must *stop*, apply a filter and stick with the things that work for you. You can vary your toolset as things change but constantly adding and deleting can be disastrous. I've read reports that use astrology and it didn't resonate with me. It didn't interest me enough to put the time into it to see if I could make it work.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

GD: I am fascinated by fractals, Fibonacci numbers, and the fact that these numerical patterns and mathematical equations appear again and again throughout nature and life. I do believe that there is, in fact, something to it. My background is economics, not science or math. As a result I am more interested in measuring supply and demand than in measuring patterns in nature. But since we are all part of nature and since markets are governed by human psychology, I do believe that there is something there. But personally, I am more interested in creative ways of measuring supply and demand.

J: Do you think there is something even in Gann theory?

GD: I actually read a couple of books on Gann theory and was fascinated. But I haven't ever tried to apply anything I read and therefore I could not make a decision on whether it works.

J: Do you believe that some of these things are the governing principles or the laws that underlie all the market action?

GD: In nature certain numerical patterns continue to appear. As a technician, by looking at charts, you are looking at patterns. It does not seem inconceivable that these numerical patterns are not somehow incorporated into charts. I can see the connection. However, I haven't analyzed it because I've been too busy. The connection would be human nature. The market is based on the psychology of people (group psychology) and I would bet there are patterns that help to predict the "masses." Why do stock market bubbles continually appear? It is driven by human nature. So, there is something there, but how does this help you to decide whether energy stocks will outperform the S&P index? I don't see how fractals help you do that (though I may be wrong). How it works is what my clients want to know.

J: Am I correct to think that making decisions purely based on things such as Fibonacci, Elliott, or Gann would not be sensible?

GD: I don't know. I don't know if I could make an intelligent answer as to whether it could work or not, because I haven't done it.

5.8.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

GD: I would say yes. I first studied the odd lotter and short interest principles when I was a junior in college. I chose these topics for an independent economics thesis, not knowing that they were technical indicators at the time. I found many things about these indicators that were interesting and learned a lot about the market. I believe technical analysis does teach you a tremendous amount about the stock market because it incorporates psychology,

the physics/economics of supply and demand, patterns, etc. I guess I always believed in technical analysis, and the more I use it, the more I believe. Things may change, and you might want to adapt your tools to a new environment, but the basic principals remain the same.

J: So you've become more convinced since when you first started?

GD: Yes.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

GD: No. Random walk? Never. I knew it was just the matter of time before the random walk thesis would be discredited. Other "great" theories, such as modern portfolio theory, are still around but they, too, are evolving. "Evolving" is a nice way of saying that professional users are finding "it does not always work." Is it not ironic that many of the modern "great theories" did not come from people working in the market place? Academic theories don't necessarily work in the real world. Hmmm, is this challenging?

J: Even when you were a student of economics, you knew even then that these academic theories do not work in practice?

GD: No. But when random walk appeared on the scene I had been around long enough to know better. I had been doing technical analysis for a while. Random walk became the great rage and I was like, 'OK, that's a nice theory, but the markets are not random.'

J: What, in your opinion, is the best proof of the validity of technical analysis?

GD: My portfolio. Or, right now, in year 2004, the best *proof* of technical analysis is that when you look at analysts who have been working in our business for 30 years or more and who are still viewed as credible analysts, you find that a disproportionate number of technicians. We've outlived a lot of other analysts. Wall Street is not an easy place; it's very cruel, actually. So if you can survive Wall Street for that length of time, there has to be something there. You cannot survive it if you are not adding value to your clients.

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

GD: There is a variety of technical books out there and I have only read some basic books, such as Edwards and Magee. Jiler's *How Charts Can Help You in the Stock Market*, or John Murphy's books are others that come to mind. I can't really say that I found anything in any of these that contradicted my experiences. The classic book on chart patterns is Edwards and Magee. If there was anything discouraging there, it was the fact that these

patterns, which are so well explained and so clear in the book, happen so rarely in real life. More often than not you are analyzing a chart which is neither fish nor foul, neither bullish nor bearish, but is somewhere in between. Today's market is a perfect example; it is neither bullish nor bearish. It is starting to change, though, which is exciting. In the current environment, people don't like to hear that a chart is neutral. In other words, they don't like to hear: I can't help you, it could go either way, or it could do nothing. It is a reality that they would rather ignore. There are times when nothing works and to a young technician this can be disappointing. In the beginning you hope you will look at a chart and come to some wonderful conclusion. But, of course, life is not always that way. I digress.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

GD: This is a bit of a bother. But the thing that bothers me the most is that there aren't one or two brilliant textbooks. Technical analysis has evolved over the ages based on theories that go back to Charles Dow (I am sure Alan Shaw and Ralph Acampora will tell you all about that, because they are the experts). Technical analysis was born in the workings and writings of some great predecessors of ours and has evolved over time. In the current day and age a whole battery of new, computer generated, fast short-term trading tools are available. So, technical analysis is constantly evolving but the textbooks have not kept up. I wish there was a basic textbook (even John Murphy's book is more on futures than on equities or bonds) that would study the history of why the charts and indicators work. What makes technical analysis so difficult is that you can read ten books on ten different theories within technical analysis. It is very fragmented. And I doubt that many of the theories have been – or can be – back tested. It becomes confusing as to what it all means and how it all fits together. That could be our basic problem.

J: So the fact that in technical analysis there are no hard and fast rules and no proven theories does not bother you?

GD: It doesn't bother me, but I think it does bother some people. I only care if it works for me, and I don't really care if it works for other people. I think we would all be wise to take that counsel. Some people use fundamentals – it works for them, and they can be very successful with it – and they don't like technical analysis. That's fine. Some technical analysts do not like fundamental analysts. Both sides should agree that there is more than one way to make money in the stock market. So, my mélange of fundamental/technical analysis works for me and that is all I really care about.

J: Does this lack of proven theories undermine, at least in part, your confidence in technical analysis?

GD: No. It frustrates me, but it does not discourage me.

J: Do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

GD: That's an interesting question. I don't know, but I don't think so, and I'll tell you why. I've spent my career analyzing stocks and more recently bonds. I will analyze anything that's relevant to the stock market. Sometimes bonds are relevant, sometimes currencies, and sometimes commodities. I will shift around from one asset to another. As I do that, I start to realize how little I know about these other asset classes because I see them working differently. Currencies are by far the most difficult asset class to analyze fundamentally or technically. BUT whenever you go to a currency desk, it is highly populated with technicians. Believe me, it's by far one of the hardest assets to analyze technically as well. Currencies tend to alternate between long periods of flatness and sharp dramatic moves. To understand why currencies behave that way, you have to understand how and why they differ from stocks. I think it could be difficult to take technical tools and apply them to weather data or any other long series of data. I find it difficult enough to apply our tools to other asset classes which are far more related. Nonetheless, the Society for the Investigation of Recurring Events (SIRE) has meetings with speakers who have analyzed and studied the cycles of weather (and other data series) with surprising success.

J: To what extent are technical tools designed to capture some unique features of the market action data that are not present in other kinds of data, such as, for example, human psychology or supply and demand? In other words, to what extent are technical tools simply measuring, statistical devices, so that could potentially work on other kinds of data as well?

GD: I think technical tools are designed to measure factors specific to the stock market, which is supply, demand, and psychology. Technical analysis is measuring investment dollars as they move around. This would not apply to weather, because weather does not get overbought or oversold. It gets extreme, but that's not necessarily an indication of buying power that is satiated. I think technical tools are very unique to the securities markets because that is what they are trying to measure. For example, price charts are technical tools that measure supply and demand; overbought-oversold and sentiment indicators are designed to measure the over or under enthusiasm for equities. I don't see this being applied to other data. Technical tools are not regression models. Unlike the models that are looking for certain preprogrammed things to happen, technical tools are not looking for certain numbers to appear. That's not the way I use technical analysis.

5.8.10 Lifestyle

J: Could you describe your working day?

GD: Not every day is the same. I usually come to the office between 7:00 and 7:30 and

leave around 6 o'clock. On Mondays the group starts with a research meeting. We talk about the week, about whatever is going on in our group, and we start planning for the next day. Mondays I also make sure that all the data files are up to date and that I know what is happening in all my indicators. I work on special projects and sometimes have a client presentation. On Tuesday I write. When the market has not moved much, this becomes creative writing. I have to be creative to find something of interest to write about. Tuesday is a long day because my team stays until we are done. This can be 10, 11 o'clock. Wednesday starts with a research meeting at 7:30am. We call a lot of clients on Wednesday. Marketing is a big part of our job. It's important to make about 200 calls a month. I tried to divide the calls proportionately during the week, but we do a lot of calling on Wednesdays. Wednesday, Thursday, and Friday are my days to do marketing. I might be traveling or visiting clients. I may have media appearances, like CNBC, Bloomberg, or CNNfn. Sometimes I'll co-host one of the CNNfn shows. (It has since been announced that CNNfn will close in mid-December). Mid-week is also when I catch up on my research and plan ahead. I look at new things, do some reading, and really watch and analyze the market. I also manage a team of people here, so I do have administrative duties, such as reviews, budgets or management meetings. I oversee the sales management function. Currently I am the Chair of the SIA's Securities Industry Institute held at Wharton for a week every March. This means developing the curriculum for about 600 attendees. There are numerous meetings and conference calls that take place during the year. Right now, I am also creating a new product based on proprietary SunGuard data. It is a project that takes a lot of my time. This has entailed working with another part of the company, getting the data, analyzing it, devising new aggregates, testing them, trying to see what our clients' responses are, developing and formatting a report and developing a new product business plan. We are well along the way with this project, so I am starting marketing meetings to decide how we will market and budget this product. A surprising amount of administrative stuff goes into my day.

J: How many hours each day do you spend practicing technical analysis?

GD: That's a great question. I have no idea, but I am sure that it's probably less than an hour or two on a typical day. It is all day on Tuesday. This is really too bad, because I'd love to do it fulltime every day. Nothing could be better than to just do technical analysis, write little notes, call clients, and talk about charts all day. But that is not the reality of today.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

GD: No. I don't think you can ever be that comfortable, but I can reduce stress by making my decisions ahead of time and by knowing what I am going to do whether I am right or wrong. So I do many things to lower stress, but there will always be events that are stressful. I believe we are in the first major correction of a bull market cycle (summer 2004) whereas

a lot of people think we are still in a bear cycle. Some of this is definitional. There is great controversy today regarding whether we are in a cyclical or secular bull or bear cycle. I try not to get caught up in the rhetoric of whether it is cyclical/secular/bullish/bearish. This helps me lower my stress. I don't expect any huge ups or downs this year. Is this bullish or bearish? Events such as terrorist activity could happen, drive the market lower and make me instantly wrong. Outside factors could change crowd psychology and instantly change the supply and demand balance. Even though we know many things about the current environment, something could fly in from the wings. Long-Term Capital Management was a hedge fund that nobody knew about, but in 1998 LTCM almost took down the entire US banking system. There is always something out there to worry about. If you are stress-free in this business, then I'd like to meet you. I can't imagine it being possible.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[14].

Would you agree with de la Vega? To what extent does your trading control your life?

GD: To me, that quote basically says 'obsession.' I am not obsessed with my work, my job, or with technical analysis, but I love it. Actually, a few years ago I thought about leaving Wall Street and I found that I liked the business too much to leave. I am really here by choice and not by obsession. The only thing I am obsessed about is my family. I think that I have a good balance in life. I am not obsessed and I think that this is a strong suit of mine. I don't take myself seriously. I don't think I am the best technical analyst, the best investor, or the best strategist. I just do the best I can, and so far it's been good enough, and that's good for me.

J: Is market always on your mind?

GD: No. I am not one of those people who cannot leave the office behind. I can leave the office behind very easily. Is my responsibility to my clients always there? Yes. I mean, I monitor the market when I am on vacation. I am always aware of what's going on. I know when I need to step up and be there for clients; but I am not obsessed with the market. I get away from it. It's important to take a break and to have a balance because the job itself is very stressful and intense. If you live on a very high pitch all the time – which I do [while I am here] – you will burn yourself out. And, yes, I've had job burnout before. But this

[14]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

did not come from technical analysis; it came from internal political battles and corporate mergers. It's important to get away from the market and relax. Relaxation and balance are prerequisites to thinking clearly.

J: Do you think about the market weekends as well?

GD: No, but I would say that the market is in the back of my mind on weekends. I will watch my Sunday political shows because I think it's important to stay on top of what's happening politically in the world. Everything that happens in the world affects the market. I am always listening to the news, reading newspapers, and judging whether or not what I hear or read is good for the market. I am doing that all the time, but I am not stressed out by it.

J: Is it possible to sometimes completely get the market out of the picture?

GD: I think it is, yet we do not realize how connected to the markets we really are! Let's put it this way: people should go on a cruise at least once. I don't like cruises, but I like the concept. When you are on a cruise, you cannot get a newspaper and you *really* do not know what is happening in the world. The "newspaper" is one side of one sheet of paper reporting all global news events. Clearly it is only highlights. Some people go absolutely crazy when they realize they have been disconnected from reality. My first day on a cruise I did go nuts. I did not believe them when they said there was no newspaper, but then I realized, 'well, yes, how would they deliver it?' I went to check the news posted daily on a bulletin board – and it was only short AP news headlines. It was nothing! For 24 hours I was in shock because I had been cut off from the world. It was very strange to be cut off like that. It was total isolation. I enjoy staying on top of world news and I am analyzing all the time – thinking about what current events mean for the market and whether or not they are important. And if news is important, I will work on the weekends. But I do not come home and talk about it and I avoid people at cocktail parties who want to talk about the market. I think a break from the market is good. Try a cruise. You realize that the world goes on without you, the news and the markets and functions just fine.

5.8.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

GD: Well, I would probably say mine! But I have seen many different people – some with music backgrounds – be very successful technicians. My background is in math and economics. I also have a course or two in psychology. I think that is a perfect combination. Of course, I had no idea that I was going to be a technician. I was not doing this on purpose. In fact, the most interesting thing is that I do not think anybody has had specific plans of becoming a technician. You should ask this question. I do not think anyone in college is

planning a career in technical analysis. But I do think my academic background provided a very good foundation to become one. It explains my approach in many ways. Again, my approach is very supply and demand oriented which comes from the economic background. I like the big macroeconomic approach to technical analysis and I try to analyze supply and demand in its many forms. Having a psychology input is great. Math is wonderful because it is all about number crunching and formulas. But I may have learned as much from my senior year black and white art class as I did from anything else. It was here that I started to look at forms and patterns and that's what charts are about. So, I like the mix I had to become an aspiring technician.

J: What advice would you give to technical analysis students? What is the key to success?

GD: Number one, understand that your first few successes with technical analysis were luck and keep working harder. Second, look at tons of individual stock charts, look at all the indicators you can, and try to back-test some of these to understand them better. Third, try many things. The biggest mistake many people make with technical analysis is that they learn a few theories, always use those, and never go any further. It's important to look at everything when you are still in learning mode. You never know when you might discover some tool that really clicks with you. Last, focus on what works for you and understand why it works. Understand the psychology behind a chart pattern or an indicator. Don't just memorize the rules. Memorizing the rules is like the tip of the iceberg – it's ten percent of the answer. The other ninety percent is the understanding of what the data is and how that data can change over time, etc. That understanding is what truly makes a good technical analyst.

5.9 An Interview with Robert J. Farrell

5.9.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

RF: Everything with me was simultaneously accidental and planned. I went to Columbia Graduate School in the mid-50's and had both Graham and Dodd, the authors of Security Analysis, the Bible of stock market analysts, as teachers. My expectation was that I would get a job on Wall Street as a security analyst. When I got to Wall Street I had no background in technical analysis and no particular interest in it. I was in a training program at Merrill Lynch in research and I wanted to find some way to distinguish myself, because there were a lot of people who were security analysts and there were a lot of people who were very smart that went to Wall Street. So the job of a technician at Merrill Lynch came up at the time when I was in the training program, and they offered the job to me, even with no background in technical analysis. It was just me and a girl who kept up the charts. I figured that since I was the only one doing this, then maybe I should really learn something about it.

Subsequent to that, after the second year I was at Merrill Lynch, I was fortunate that the head of the research department was replaced and put on the staff of the president, and he asked me to go with him. In addition to his fundamental background (he headed the research staff of fundamental analysts), he was very much interested in markets, in the behavior of people, and in how markets were affected by people. I joined with him and he became by mentor and my teacher. I learned a lot about analyzing the market from him. As time went on, I thought it would be important to shed the idea that a technician is a short-term trader. There was a group of technicians that got together in the 60's and were called the Tip and Clip Club, because each one would recommend the stock that they had last bought, hoping that they would get some other interest in it and then be able to go on to sell it. I realized that if I were to have a future in this field, I had to cultivate the institutional market, and to cultivate the institutional market, I had to have more of a long-term perspective than a short-term perspective. It's my opinion that the most useful technical and market analysis has a longer term focus to it, and I say this because there are more nonrandom long term movements.

As I went on, it became very apparent to me that being a technician was not something that was going to put me on some kind of pedestal. It was not a profession that you could be proud of at that time. Most of the institutional customers that I dealt with were very skeptical about what it could be offering. What I was able to do through my mentor was to study the psychology of the markets to a much greater extent than just looking at whether a chart broke out or had a reversal formation. We spent a lot of time analyzing various types of data that was generated internally at Merrill Lynch, such as, for example, the buying and selling by margin accounts. The margin trader was the aggressive buyer of stocks; when he was skeptical and selling, that was a good sign, when he was piling in and buying, that was a bad sign. At that time I was also introduced to a friend of my mentor, Bill Dunkak,

named Sandy Landfield. Sandy Landfield was the partner in charge of floor positions in the Carlisle DeCoppet odd-lot house. At lunch he would discuss how the odd-lot mentality was evolving, how he was positioning the stocks his brokers had, and how much inventory they would carry based on how the book looked and how orders were flowing.

It became increasingly apparent to me that this whole subjective area of market psychology or market sentiment, as we identified it in the 60's, was one which was not developed to any great degree. We had the stop-loss orders, short sale and short covering trades data available, and we were examining that data on a total basis as to which way people were going with their transactions. A basic thing I also learned was to read the authors who had some original insight about the history of the markets. For example, Garfield Drew was the original odd-lot theorist. Humphrey Neil wrote a book about contrary opinion – everybody talks about contrary opinion today, but back then it was not as common.

Gradually I was learning a style, and the style was not to be identified as a chartist or a technician, but as someone who had historical insight, like my mentor. Every day after the close, my mentor and I would go over what was happening in the market. He would chart the Dow-Jones Industrials, the transports, and the utilities, and he would say, "I remember that formation. It looks just like 1938." Then he would go back to look at 1938. I did that so much with him that I committed to memory what all the markets looked like at each given point in time since the 1920s, and I gradually became aware of the cyclicality of the markets.

In any event, I went into technical analysis almost by accident. I became the first president of the Market Technician's Association, I think because I had achieved a little more professional respect for the kind of analysis that I did, and because I was representing a major firm. Again, I was almost dragged into it, rather than being the big pioneer saying "here is what we have to do." So I was part of the group that put the MTA together – I put some effort into it and organized a lot of programs in the beginning.

In fact, our first award for excellence in technical analysis went to Lyman Lowry, who formed Lowry's Reports in 1933, which is still operating today. I have been a subscriber to the Lowry's Reports ever since I began working in technical analysis. The interesting thing is that it is a mechanical approach measuring quantitatively how much buying power and selling pressure there is at any given time. What I felt was most useful about Lowry's Reports was that it was a service that provided a quantitative measure rather than just an opinion. Everybody has a opinion, and to me opinions are valuable only where they all agree – then I know that that's not what's going to happen. I also figured out that we have all these smart people on Wall Street, most of whom are quantitative types. They are among the smartest people who can get 1500-1600 on their SAT scores, and I knew I could not compete with that. There is left brain and right brain, and I felt that I was more right brained intuitive and more street smart, and that was what I thought I should develop to add something extra to the equation that would help investors.

Everything that I have done was not typical of technical analysts. I did not want to be called a technician even though I was the first president of the Market Technician's Association. We named our group at Merrill Lynch the Market Analysis department – I emphasized

more the psychological and the historical relationships that I thought were important, and cycles would come into that as well.

J: Is this something that you realized early on, or is it something that you learned to emphasize along the way to make your approach more accepted?

RF: All of it was evolutionary. When I first started, I was just looking at charts. I was introduced to the historical and the psychological part of it through reading books, like The Great Crash by Galbraith and 10 Years of Wall Street by Barnie Winkleman, which are some of the really good books about the 20's. So I was reading at least what some great historians had to say about how mass psychology developed. Mass psychology was an important part of my thinking about how to analyze the market. So my development was evolutionary. It was not like I had this big plan and knew how everything was going to turn out.

J: Did your mentor point you in the right direction and to the right books, or did you learn mostly on your own, by trial and error and by exploring different options? Did you have a teacher that taught you the craft?

RF: I really never had a teacher in technical analysis. Most of the academic world did not regard technical analysis as worth much. I learned by doing and from my mentor, though at the time I did not realize he was my mentor, I thought I was beginning to understand all these things on my own. I also learned how important communication was, so I became a reasonably good writer. To communicate ideas and to get people to act on what you think takes some doing – you have to get their attention. A new idea is hardly ever immediately accepted, it must be repeated and repeated until markets begin to verify that the idea sounds like it is going the right direction. That's not technical analysis. When I was evolving into this, I was first really dealing with Merrill Lynch retail offices, and that was the short term trading stuff. Then I realized on my own that I should cultivate the institutional clients who are not going to be interested in just short term trading – they have portfolios where they have to keep turnover down and try to find long term trends that are important.

In 1968 my mentor retired, and I was then made a head of the department. We had a technical department of 16 people, which was the largest on the Street. We had a meeting every day before 8:30am, and everybody at the department was encouraged to contribute their ideas. One of the things that I did as a head of the department was to encourage all of the technical analysts that worked with me to specialize in something. For example, one would specialize in Elliott Wave and another one would specialize in odd-lot theory or cycles – that way each one of them could know more than I knew about any given area. Their contributions could help formulate the opinion, but somebody had to make a decision. You are going to have lots of different ideas as to what you should do, but it turns out that the best decisions in the stock market or in running money are not committee decisions. Committees don't take chances, don't go out on the extreme, they stay bunched in the middle. They could be right, but they are not going to provide the real value added.

In any event, that was where I was going. It was all evolutionary. I gradually found that I was best off being a contrarian and by looking at what the markets were saying versus what people and the economists' surveys were expecting – when they all agreed in one direction, I at least had one alternative to rule out. So I had a starting point. With a lot of things it was more intuitive like that rather than quantitative. People say to me, "Gee, if you are a technical analyst, you must do a lot with numbers." Well, I do, and I do hand-chart a bunch of things even today, but I look at the numbers as a representation of how people are reacting – I ask myself whether the numbers represent an extreme in one direction or the other, whether the extreme is a good extreme or a just another opportunity to sell or to buy because it is a modest extreme.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your analysis?

RF: I was thrown into it right from the beginning knowing nothing, so I had to be fast in finding out more. Fortunately I did go into the research with my mentor. We were on the staff of the president at the time, so I didn't have as much interaction with the sales force for four years – it was just a learning process during that time. So I was learning from him and from the people he introduced me to, from what I was reading, and from the clients I talked to.

J: You mentioned that you used books about crowd psychology. Did you also read texts such as those by Edwards and Magee or Schabacker?

RF: Yes, I read those. I can't say I memorized everything that was in Magee and Edwards, but Schabacker had a lot of good stuff. Magee and Edwards really put together a lot of the basic pattern recognition technical analysis of charts, probably the equivalent of security analysis by Graham and Dodd for fundamentalists. So I did read and consult with that.

J: In retrospect, what do you consider the most critical part of your learning process: interaction with your mentor, literature on crowd psychology, or technical texts such as Schabacker?

RF: I think it was a combination of things. I knew I had to measure the message of the market, whether it was overbought or oversold and what the trend was. When you are starting out and you look at the chart and see that there is breakout which looks like a great opportunity, you will follow that. If you are early in the cycle, breakouts work, if you are late in the cycle, breakouts can be a big trap. Or if you get into markets like today where there are so many people who practice technical analysis, use charts, use computers, and are examining every trade, there is lots of room for fakeouts. I developed over time (and I am not unique in this) the theory of the under-cut-low, which says that if the market or a

stock is coming back down to a previous low or a previous series of lows and breaks that low, many times people consider that as a time to sell and yet many times it turns out to be the time to buy – you shake out a lot of the weak holders and then things turn around. Now, you always have to have discipline to be sure you don't get caught in something that does follow through. In any event, I became a great skeptic – I did not believe most of what I read or heard about the market.

Very early on we were onto the magazine cover idea that if you get a bull or a bear on the cover of the Time magazine, that's a pretty good indication that everybody knows that it's a bull or a bear market and that usually happens very late in the game. There is someone who claims that they are the ones who discovered this, and I forget their name, but I would differ with that. Not that I discovered it, but there was a young man who came to work for me in 1976 named Pat Reagan. He mentioned this to me, and I thought it was a good idea. One of the things that I learned over time is that you can't think of all the good ideas, but you should be able to recognize a good idea when you hear one and give attribution if you are going to use that idea. One of the things that Pat Reagan was distinguished for was that his academic work was to find inefficiencies in the market, to find ways that you could make money from technical analysis or market analysis. He did not assume that nothing works as many academics did at the time. He had a study on late reporting of quarterly earnings. Companies tend to report earning about the same time each year. And the later they were, the more likely it was disappointing. It was a clue which you might interpret as fundamental, but in my way of thinking, that's part of market analysis, which is looking at these unusual events that take place.

One of the things that I thought about is that I have never been high on quantitative analysis, because I am not a great mathematician. It's not to say that I don't use quantitative measures. All my life I also have been an anti-academic, not because I don't know some very smart people who are academics. Jim Lorie of the University of Chicago was one of the first people that we invited in the early 70's to speak at the Market Technician's Association. He was basically making the case for the efficient markets and that was back in the days when A Random Walk Down Wall Street by Malkiel was popular. If you look at the evolution of academic work, the academics have started out by saying that nothing works – they were even taking potshots at the fundamental analysis and saying that their work was useless as well. Then you got to a stage where there was some recognition that there was somebody out there who was getting better results than the rest of the crowd and that there had to be some inefficiencies.

For example, a graduate student by the name of Victor Niedehoffer came to work for us from the University of Chicago. He must have been 20 or so. He was a young guy who carried a teddy bear around – he was really far out. But they allowed him down on the New York Stock Exchange to examine the specialists' books. He noticed that orders tended to cluster around the round numbers, and he came up with the theory that if you want to sell something, don't put your order at 80, where all the other orders are, put it at 79 7/8 (this is back when trading was in eights and quarters). Or if you want to buy something at a limit, don't put it in at 76, put it in at 76 and an eighth or a quarter. It was called the "clustering

effect." That was useful stuff. That was useful for a guy who wanted to make a buck. I think the academic interest developed as we went on beyond that. Technical analysis got a little more credit from the academic world, not a lot, because you can find an exception for every rule. Technical analysis is an art, and it's hard to teach it. You can teach someone the basic relationships as well as the sophisticated quantitative stuff that I am not as familiar with, but the art part of it is hard to teach.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

RF: Once you put your money to work, then it's much more emotional. It's very easy to tell people, "this is the way it should be," but when you have to pull the trigger, that requires a special skill. That's why the best analysts don't necessarily make the best portfolio managers. One of the major things that I learned is that you never take a position on a technical basis and then if it doesn't work say, "well, this is fundamentally pretty good, so I'll keep it." You want to integrate the two, but you can't use one as an excuse for the other or an excuse for the failure of what you are trying to achieve, which is a trading gain or a trading short-sale gain.

J: Which mistake did you learn the most from?

RF: For a while I didn't learn to cut losses. I made those mistakes about using fundamental analysis as an excuse for the failure of the technicals. I'd say, "that's a good stock anyway," despite the fact that the technicals looked bad – that was always wrong. After quite a few years what I did realize was that the most effective analysis was sector analysis rather than general market analysis. I've spent a lot of time analyzing where we were in a market cycle and what the general market was likely to do. I found I was not as accurate in saying this is the top and this is the bottom as I was on saying this is the time to own oil, this is the time to own consumer growth stocks, etc. In fact, I went on from there. I resigned as the chief market analyst at Merrill Lynch in 1992, and turned over that job to Dick McCabe who is the chief market analyst there now, because I wanted to be a senior investment advisor doing theme and profile investing. So, I wrote reports on long term themes, like the aging population and the benefits that the aging population could have for the drug companies as an example. I felt this was something that was needed on Wall Street and I wrote about it for 8 years or so. It was popular with some of the institutions, but it never caught on a broad basis. Also, the firm never really promoted it and I wrote it almost all myself. In any event, the mistake I made early on was to concentrate too much on what the overall market was going to do, and not spend enough time on major sector trends.

5.9.2 Personal style

J: Could you describe your own distinct style of technical analysis?

RF: It's basically looking at the message of the market. I believe in long term cycles, I believe there are no new eras, only old eras that go to new excesses, and I believe there is the return to the mean. I have some very simple premises. At one point I realized that when you have a boom or a bubble, the same pattern follows each time. There is a big break, like in 1929-32, and I call that an "A" wave. Automatically that goes so far that you get a return move – not a new bull market, but a partial or maybe even full retracement in some cases. Most of the time it is a half-way or a third-of-the-way retracement, i.e. what I called the "B" wave. Then you go into a long period of markets either going down and making new lows or going sideways for a long time in a "C" wave as the excesses are purged and as what got overvalued winds up being undervalued. I still write about these A,B,C patterns today. For example, I say: "Nasdaq has had a big A wave down and a B wave recovery is the next step. When the B wave is finished, there is a C wave coming, probably lasting several years." A lot of the things in my style almost sound more fundamental than they do technical, because I try to integrate the intermarket relationships, which is the idea that if oil stocks are doing well, then the price of oil has a relationship to that, or the idea that there is a relationship between the gold and the dollar. I comment on or try to integrate a lot of different markets into my analysis, so I am kind of a broad generalist with a historical bias.

J: How much of what you learn from others do you directly apply in your analysis?

RF: Well, that covers a lot of ground. There are some people that I respect a great deal, and if they disagree with the analysis that I have of what's going on, I reexamine it. I don't necessarily change it, but I say, "well, I have to watch this." And that's not a lot of people. I used to subscribe to *Forbes* because John Schultz wrote a column for *Forbes*, and I thought that John was the best intellectual technician of this past period. It was helpful to me to see what he had to say. There were a few other people like that. On the other hand, I value much of the opinion of others as a contrary sounding board.

J: How do you learn what works for you and what does not, without making big loses?

RF: Have a discipline, such as don't let losses go beyond 15 percent. When you go into an investment, a trade, or a position, go with the knowledge of the things that will indicate that your position needs to be changed. The rules are not hard and fast – you have to have a discipline, but if there is a violent shakeout in the market, it can trigger a whole bunch of sell signals that way. If it's a temporary shakeout because of some big news item, I also have to know what the trigger was and act accordingly.

J: In what kind of market conditions do you make most mistakes?

RF: The late cycle market, particularly the late bull market where you have more trading range behavior and where the market is not showing a clear trend – for example, more stocks are failing than earlier – becomes a more difficult environment to operate in. That kind of market – the late stage of a cycle and then the trading range – is the most difficult, especially if you are short-term oriented. But I'd rather not do mainly short term trading.

J: How much of what you do are you willing to share with others?

RF: One thing that I never believed in was a black box. If you have a black box and say, "I have a system, but I am not going to tell you anything about what goes into it," you demand a lot of faith from your constituents. If you are right, there will be a typical group that will follow you until you go off the cliff. But then when you do make a mistake with a black box, you lose everybody, because they don't know why you made the mistake since you said that the black box was going to be right. So I have a tendency to share what we do with any of the people that we interface with and talk to.

J: Would you say that all the strategies that you use are in the public domain?

RF: Yes.

J: Now, if all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

RF: It's an art. We can all have the same information, but we have to figure out which information to emphasize at any particular time. It isn't something that you just plug into a formula. You can't say, "well, everybody has got the same information, therefore, everybody is going to do the same thing." People act differently on the same information. That's always been true. That's why we never had any problems sharing our internal data or the results of our internal data with our clients. We found that they were very interested in it, but not all of them knew what to do with it. So, it's the experience and the art that makes it work for some and not for others. In some markets it's hard to distinguish random noise from something that is signaling a real breakout or a new trend, but you give a trend the benefit of the doubt until you go beyond your parameters where you are too far in the other direction. If you are trading too actively and you are using intraday charts, and everybody has the same information, there may only be little nuances that are different – somebody is going to start saying, "well, if they are all going to buy on that, I am going to sell, just to take the view that it's better to be a contrarian." But your question has been asked a lot over the years. Why is it that you can get a better answer from the same data than somebody else? It's because of your understanding of where you are in the cycle and because of your experience in dealing with the data.

J: Is technical analysis more effective when used on its own, or when combined with fun-

damental analysis?

RF: I prefer to know what the economic background is and what the fundamentals are in a company. It's like knowing the yield on a stock. Suppose you don't like the chart – you think it should be a top and it's going down – but the yield is much higher than the normal yield level and you see that there is steady increase in the dividend, then you are likely to be more leery of shorting that than you would be if you didn't know that information. There are lots of other examples. When I was doing theme and sector investing, I would look for long term trends that were fundamental trends, such as increases in the older population which could help the drug and medical device companies. I started looking at the charts of the companies that made hips and knees after I got a new hip five years ago. That was a fundamental factor, but I said, the population is aging, and I am not the only one who is getting new hips. So first I looked at how much the population was growing, then I looked at where the leadership was, where the stocks that were going to do the best in this situation were. That was an integration of fundamentals with the technicals, in a crude way – I am not getting down to the analysis of the balance sheet or looking at the basis for the earnings.

J: How much of your technical analysis is done on an intuitive and subconscious level?

RF: A lot. I would say it's probably 60-70 percent. Intuitive covers a lot of ground, it's not just saying that you have a hunch. I do believe that if you have a good or bad feeling about something that you should go with the feeling looking for some evidence to support it. I used to hire analysts, and one time we had a guy come in who had great credentials. He pushed all the right buttons and we decided that we would make him an offer. So we called him back and made him an offer that was higher from what we initially intended to pay because he was quite qualified. The first thing he said was, "I have some questions. I want to know how big my office is going to be, when I will get my first promotion, how long is my vacation going to be, what my title is going to be." These are all things that you want to know in time, but you don't ask those questions to begin with. And we didn't hire him. It was a gut thing. He was a smart guy who had great credentials, but the intuitive said that this guy had a wrong emphasis on what was important.

5.9.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

RF: The most useful to me are the sentiment indicators, with which I analyze where the consensus is and what the contrary might be. The least reliable are the short term chart patterns. My belief on chart patterns is as simple as can be: umbrellas are bearish and saucers are bullish. It does not take a lot of intellectual skill to figure that out. If you look at a long term chart and you see these big umbrellas forming, you'll know something is getting in trouble.

J: How do you test patterns or indicators before you start using them with real money? Do you ever ask for other people's opinion when you are making such decisions?

RF: I don't go though rigorous mathematical testing, though we have done that on some things when we were using our internal data, like on margin account buying and selling or on internal short selling. What we found is that when you put parameters on indicators where you say this level is bullish or this level is bearish, the levels tend to change over time. I have always been an advisor, and I do not run money other than my own. Therefore, when I started using it with real money and it was my own money, I was pretty cautious. As you might guess, I am pretty cautious or conservative person. There are certain patterns that I pay attention to. In the early stages a market goes up little steps at a time, but when the market is the late stages, it often goes up in a straight line or in big unsustainable increments. That's the blow-off stage, something that you would describe as the final panicky buying stage. You can see that on a chart. Lots of times that's the best time to own a stock, that is, you make the most amount of money in a shortest time in late stages blow-offs. For example, the internet stocks in the late 1990's were doubling and tripling in a matter of weeks, yet that was also the period when the greatest risks were developing. I know what patterns will influence me. One of the mistakes I made was being early on recognizing extremes in crowd psychology. In the technology boom I thought in 1998 and 1999 that it was getting really excessive, but it kept going up. So there is this fine line between being early and being wrong. Right now we are in this housing boom, and the price of houses is going through the same kind of acceleration. You know it's going to end badly at some point, but you don't know how far it's going to go first. It's one of the trickiest parts of the business, but you should be able to recognize when your risks are really rising even when you are making a lot of money.

J: Is the number of indicators you follow greater when you are dealing with larger amounts of money?

RF: I use the same things whether it's a lot of money or a little money.

5.9.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

RF: That's a long story, going back to the 20's with Gartley, Gann, Dow, and Schabacker. It started with the recognition of patterns in stocks and trends that you could follow. There was a recognition of what a reversal pattern was. Chart reading defined the early stages of technical analysis. Edson Gould and George Linsey added a significant further element to it in recognizing cycles, and even putting numbers on cycles, such as how many years a particular cycle should last and what kind of retracement should be expectable. They also

got into the psychological part of it, but sentiment analysis was another development. Now the interesting thing is the academics have discovered behavioral finance. Technicians have been doing behavioral finance for decades. I guess it was within the "publish or perish" environment of academics that they needed something new to work on. And I know that they came to the Market Technician's Association for some data and some help on that. It seems kind of ironic that the academics who did not believe in technical analysis at all could come back and win a Nobel Prize for recognizing something that technicians have recognized for years.

J: You mentioned that in the evolution of technical analysis first came the chart patterns and then came the sentiment indicators. How did technical analysis develop further as a field?

RF: It's gotten into quantitative measures. There are a lot more sophisticated indicators today. I use things that I did not use before. There is a difference between (1) things that measure what people are doing to get an idea about what they think (e.g. if people are buying heavily, that gives you an idea that they are bullish), and (2) what they say. There are a lot of polls, such as the Investor Intelligence poll (bulls and bears among market letter writers) or the American Association of Individual Investors weekly poll of individuals, but I tend to favor things that measure what people are doing rather than what they are saying, such as put-call ratios, short sale statistics, and mutual fun inflows.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions? Do you study the new inventions just to know what others might be doing, or do you also update your own strategies as the field evolves?

RF: I read enough to become aware of some of the new things that analysts are using. I don't know a lot of what's going on in the academic world – there could be a lot going on of which I am not cognisant that has value.

J: To what extent has the introduction of the variety of computer software aided the craft?

RF: It certainly has helped make more information more quickly available. I can look every day at 200 indicators on a computer – I could never have kept them up by hand. One of the problems is that people try to use software programs to come up with the answer. Over the years I had somebody coming in every few months with a secret indicator that could make you rich beyond the dreams of avarice. Invariably they worked for a while and then they stopped working. In any event, software programs are very valuable in the amount of data that they can analyze and in the quickness with which they make it available. But I don't think there is a substitute for making a judgment about what the results mean. I don't know how far artificial intelligence will go, but this is still a people game. People make markets. If we are all going to be a bunch of robots then you could say, "well, let's trade

everything at book value."

J: To what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

RF: I don't use computer generated signals to any great extent. I look at Lowry's buying power and selling pressure, and of course if they go negative or positive, that influences me, but I don't buy stocks because a computer tells me that I should do so.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

RF: Yes. You have to have some hands-on experience. I do it because I have always done it and I am comfortable doing it, but I don't go nuts with it. There was a guy who preceded me at Merrill Lynch as a technician who had hundreds of indicators which he plotted by hand every day. I just said, "I can't do that, life is too short."

J: How many do you plot by hand?

RF: Maybe ten indicators.

J: Do you use point and figure charts?

RF: I use all kinds of charts. Mainly I like to look at daily, weekly, and monthly line charts to get the shorter and the longer term perspective. I'd say point and figure charts are helpful too. They sometimes remove the noise and help with projections.

J: What are the ten indicators that you plot by hand?

RF: I plot the Dow, volume, and breadth every day. I plot the 7-day advance-decline index every day and the 5-week advance-decline index every week. I plot the put-call ratio daily and a 26-week breadth ratio weekly. Those are the ones I can think of off hand.

J: Do you plot these for select stocks or for the general market overview?

RF: The general market overview.

5.9.5 The innovative process

J: What drives your innovative process?

RF: My innovative process has been evolutionary. I look at different things. I measure psychology extremes and look at where we are in a cycle. I don't use the same tools all the time. That's the intuitive part of it. It's not something that you are going to be able to plug into a computer. What I've learned (and this has been very helpful to me) is that when something stops working or something that should be a signal does not seem to work, then I need to explore it further, see if there is something else, see if maybe something is changing with that indicator.

J: So then there were moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

RF: Yes.

J: How soon after you develop a particular technical tool do you make it accessible to public?

RF: I don't do that any more, I don't have any public clients. I only have institutional clients. I am retired from Merrill Lynch, I have my own little business. Before, when I was at Merrill Lynch, if I found something that I thought was a valid relationship, I would do my best to explain it. I believed in making people understand how and why something worked that we considered to be an indicator.

J: Why did you do that rather than keeping the edge just for yourself?

RF: Because it's an art. I could tell someone how I think an indicator should work, but it takes a lot of time for someone to get to the point where they can rely on it. I have never had a problem with sharing, because everybody has a different experience with which they go into the stock game.

J: Are there tools that you developed but never shared with the rest of the world?

RF: There was some internal data at Merrill Lynch which we could not share because it was not public information, but mainly the answer is no.

J: How often do you use the technical tools you developed?

RF: All the time.

5.9.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

RF: It's never easy to lose. It depends on the bets you make. If you think something should be bought and you don't buy enough of it, George Soros would think you are wrong even if you are right. Yet if you are more conservative, you may not make that full bet that George Soros would make. A very good test of your emotional background is how much you can stand to have the market go against you. This is a very good test of your emotional background. I try not to let it go too far against me. I remember one of the first stocks I ever bought was Raytheon. That was a good fundamental story – this was in 1958 or 1959. The chart was OK and then it broke down. I did not get out of it. I got killed. It taught me a lesson. I couldn't afford to lose money at that point. That's the other issue – what can you afford.

J: So it becomes easier because you can afford more.

RF: Yes, but then it depends on what bet you make. If you make a huge bet and you have a lot of money, then it's just as much of an emotional strain on you as not having a lot of money and making a modest bet which you still cannot afford to lose. I am 72 so I am at the stage where I don't take big risks. Investing conservatively gives me more rewards than being aggressive. In fact, this is something I used to tell the retail salesmen: if you buy something with expectation of modest gains you will be surprised by how well you do, whereas if you buy something expecting to get a big gain quickly, you will be surprised by how easy it is to be disappointed.

J: Has a big loss ever made you doubt the validity of technical analysis?

RF: Like I said in the beginning, I don't want to be known as a technician. I am a market analyst, group psychologist and historian. Technical analysis is an art – if it doesn't work it's your fault rather than the fault of technical analysis.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

RF: The emotions are significant in many ways. We all don't like to admit a mistake, and being able to admit a mistake is very important, or else you are going to compound that mistake. You often can see the following situation: analysts recommend a stock, the stock goes down, they recommend it again, and the stock goes down further. The analysts wind up digging a hole because emotionally they get caught up in not wanting to admit a mistake. So I always taught that it was important to analyze the analyst as well as the stock that he was talking about.

J: Do you feel that you have learned to control your emotions better over time?

RF: Yes, experience helps.

J: What was your attitude like in beginning of your career?

RF: I think that the most successful people are insecure. As soon as you think that you have all the answers, that's when you get in the most trouble. So I was always reexamining my premises. Another mistake that I could talk about was the times I would have in my mind a pattern, such as a final wash-out or selling climax to a decline. But instead of having a selling climax, the market turns around from a soft bottom. Can I admit, "gee, that's a good turn, but it didn't fit with what I thought was going to happen"? It has happened to me that I wasn't able to admit that right away. You have to have discipline to admit that you were not right and adjust your thinking.

5.9.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

RF: Creativity is realizing interrelationships of markets and the relationships between the technicals and the fundamental, economic, political, and other backgrounds. But creativity is 5 percent inspiration and 95 percent perspiration, like anything else in life. Can creativity be learned? I don't think so. You either have a creative bent or you don't. More people are mechanics.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

RF: Everybody can be replaced to some degree, but if you are asking if artificial intelligence will be a total substitute for a human analyst, I doubt it. However, I don't know enough about artificial intelligence and how it can be programmed, so I cannot give you a good answer to that.

5.9.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

RF: It plays a part. You could buy a stock because you thought a lot of things fit together, e.g. it's in the right group, it's a leadership stock, and it came out of an accumulation pattern, but then a merger could be announced causing the stock to go up, and you are could suddenly be lucky to be the person who picked that stock. Luck plays a part in everything, and there is a saying that it's better to be lucky than to be good, but I'd rather have basis

for my conclusions – if luck comes in in addition to that, fine.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

RF: Yes. Arch Crawford, who most publicized astrology as his tool, has a pretty good record. However, I think he is a good technician, and he uses astrology as a marketing device, because everybody is interested in some kind of fortune telling. But I think he is right more because he is good technician than because he is a good astrologer. However, it is also true I do not know much about astrology.

J: So you think that he uses technical analysis on the side?

RF: Oh, he does. He used to work with us, and I thought that he had a lot of good intuitive and technical skills. Maybe midway through his career he came up with astrology.

I don't think inclusion of astrology does much for technical analysis. I am amazed how much the press and the TV interviewers really want to hear what an astrologer has to say. Astrology is like the black box that I talked about. If you are right enough times, then people will listen. It's very hard to keep their attention once you are wrong. I don't think most of the people would understand astrology.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

RF: I think there are cycles and waves in stock market behavior. There is some definite validity to some of these studies. Elliott Wave is based on the Fibonacci numbers. What I always found is that the Elliott Wave always had an alternative outcome, so if it didn't work out as it should have, there was always an alternate count, there was always some way where you could say, "well, I read that wrong, and it's something else." I do know some people who have done very well using Elliott Wave. I know Bob Prechter has had a significant degree of success with it. Walter Murphy who worked with us at Merrill Lynch and who still works there is also one of the best Elliott Wave people. It's not something to use by itself though, it's something to use as a guide in my opinion.

5.9.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

RF: I've always been convinced about the validity of market analysis, ever since I started studying it. I thought that it was a useful approach, but it had so much more to it than just

looking at charts. It was a reason that I called it market analysis and did not want to be labeled as a technician.

J: Did you become more or less convinced since when you first started?

RF: More convinced of the things I thought were important.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

RF: No, I though that was pretty good stuff. I am more concerned if the academics get to the point where they are giving credibility to technical analysis. I don't know how far that's gone. I would like to say that it didn't bother me at all, but I guess it did bother me some, because I would not be as much of an anti-academic as I am. Anti-academic doesn't mean that I don't think academics make great contributions, but in a lot of ways they don't live in a real world. In my opinion, the fact that they didn't like technical analysis actually gave it more of a chance to work. The more people believe into some approach, the more whipsaws and the more noise you are going to get.

J: What, in your opinion, is the best proof of the validity of technical analysis?

RF: Whether you can make money or not. If you can make money using it, that's the best proof that it has some validity. I think the fact that there are cycles in markets and in nature says there are other forces to look at other than just asking if the economy is good or bad or if interest rates are going up or down. I remember in the 1990's, economists started becoming experts of the stock market. But they didn't become experts of the stock market until near the end of the boom. That was the kiss of death when the economists saw that economy was going up and the stock market was going up and when they just said "well, the economy is going up so the stock market will keep going up." They really thought they had the answer. Of course, when the market goes up faster than the fundamentals, you get an expansion in the PE multiples and overvaluation, and eventually you reach a clearing price and back down the market comes even without the fundamentals crumbling.

J: Did you find that your experience with technical analysis contradicted statements made in books (credible or classic litterature)? Did that ever discourage you?

RF: It certainly didn't discourage me if literature did not agree with what I thought, because I tended to emphasize what I thought was important. I always got more nervous when I had more company. The books that I thought were important I largely agreed with.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

RF: No, I though that was good, because if there are hard and fast rules then everybody would learn them – everybody would act in the same way, and nobody would make any money.

J: Do you believe that technical analysis works even when applied to data other than the market action data (e.g. the weather data or the river flow data)? Please explain. (In other words, to what extent are technical tools designed to capture some unique features of the market action data (such as, for example, human psychology or the law of supply and demand) that are not present in other kinds of data? To what extent are technical tools simply measuring, statistical devices, so that they could potentially work on other kinds of data as well?)

RF: There are cycles in nature, so there is some similarity. Hurricanes used to all go into the Gulf Coast, and now we have a cycle with the hurricanes going up the East Coast. There are all kinds of phenomena in nature. If there are a lot of lemmings, there are a lot of foxes. If there are very few lemmings, then there are very few fox babies born. You can relate a whole bunch of things like that, just like you can relate things in technical analysis. But there are things that you can do in technical analysis which wouldn't be meaningful when applied to the natural phenomena data. For example, I don't think that it would be meaningful to apply head-and-shoulders pattern to river flow data.

5.9.10 Lifestyle

J: How many hours each day do you spend practicing your craft?

RF: It depends, some days it's three or four, other days it's an hour or two.

J: How about when you were at Merrill Lynch?

RF: A lot. I'd get to work at 7am and I'd get home at 6pm, and I'd do some work after I got home as well.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

RF: There are always stressful moments usually coming about from the short term noise, such as when you feel like, "maybe I was too soon on this or I got this one wrong." I found that I had much more stress when I worked at Merrill Lynch than I do now, even though I am writing about what the market is doing just as I used to do before. My stress is reduced maybe because I travel less and because I don't have a bunch of people calling me. There is always some stress in anything you do well. It's usually self-imposed stress, and that was true with me, meaning I wanted to be right and to do something well. There is the institutional investor all-star team. I was number one on this poll for 16 out of 17 years, and in

1985 I was number two. John Mendelson, the guy who was number one that year, deserved it. There was a group at Merrill Lynch that had lunch once a year, and they gave me the Avis award. You know, Avis is number two, so they were basically saying "try harder," and that spurred me on. I always tried hard, but there was stress. Each year I asked myself if I was still going to be ranked that way. But I wasn't highly ranked because I was righter than anybody else, it was because of the way I communicated my ideas. What I always did was to emphasize something that I had a high level of conviction about. If I was not convinced about the market so much, about which stage the market was in, I would pick out the sector that I thought for sure was the right place to be. I was pretty good at that. I was rarely shut out, not that I wasn't wrong at times.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[15].

Would you agree with de la Vega? To what extent does your trading control your life?

RF: I am not that devoted to it and all-consumed. But I do think about it, and it does have significant influence on my thought patterns and my life, and it always has. There is an element of truth in that, but that's the extreme. The best at anything are very focused and consumed by what they are doing.

But coming back to your previous and related question – "Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?" – the answer is no. Moreover, I don't think technical analysis forecasts future price moves. People try to forecast. A philosopher by the name of Eric Hofer wrote a book of aphorisms and there was one aphorism that said, "the true prophet is not he who predicts the future, but he who reads and reveals the present." For example, if you are looking at the chart and you see you've evolved through a long bear market where you have an "A" wave down, a "B" wave recovery followed by a long "C" wave down, with a base forming and where nobody likes the stocks any more, the stocks are historically undervalued, you don't predict the future from that, but you buy that today because it has the potential to do better. The ingredients for a new uptrend are in place. That's reading and revealing the present and saying that that's going to project into something different for the future. Using that common wisdom, when people ask you to predict the stock market, you give them a price or you give them a time, but you don't give them both. If you say that it's going to be at a certain point 6 or 12 months from now, and that really happens, usually that's luck.

[15]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

In any event, I have a narrow focus. I wish I did know more about more things. I read a lot, but the predominant reading I do is related to business. I do read other things for entertainment, but I enjoy doing this. It's a passion, and one of the nice things is that you can continue doing it as you get older. And, when you get older, you want to exercise both your body and your mind. Staying involved is a way of exercising your mind. I could do something else, I could learn something new or go to college again, but I enjoy doing this.

J: Did this quote hold for you in its full intensity in the beginning of your career?
RF: No, I was never consumed that much, not even early on.

J: Did you consciously have to work on developing balance in your life?

RF: Yes. My wife helped me do that. If I got invited to give a speech by somebody from Merrill Lynch on a weekend, I wouldn't go. I'd say, "that's my time." I was able to do that. Some people may not be able to do that, because they might be afraid of getting fired, but I stuck with that.

5.9.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

RF: You can have almost any formal undergraduate education to become a technician. I don't think you have to have a special mathematical training or be an engineer. You can be in the arts and you can still be a good technician. One of the best technicians who ran money was Howard Stein who ran Dreyfus and Company. He studied music. You can find somebody to help you understand what technical analysis is about, but I think street smarts are more important than book learning. Understanding crowd psychology, having a knowledge of the history of crowd behavior, and having an ability to communicate, to get your ideas across, are all important. I have more books on quotes than I have on the stock market because I used to start every comment I wrote (and I wrote one every week for a lot of years) with a quote. So I would use these quotes, but I would turn them around. Instead of saying, "every cloud has a silver lining," I would say, "every silver lining has its cloud." I've always tried to produce something distinctive. In the latter case I've tried to read or express the quote differently so that it might be more understood.

J: What advice would you give to technical analysis students? What is the key to success?

RF: Figure out what your strength is, whether you are right brained or left brained. Simple things work best. Look at technical analysis as a way to long-term investing rather than short-term investing. Look at it from a sector standpoint rather than trying to call the general market. Try to identify extremes in behavior so that you can be prepared for reversals. Have an exit strategy, and constantly review what the consensus is so that you

have something against which to take a valid contrary view.

5.10 An Interview with Ian McAvity

5.10.1 The early days

J: What and when first triggered your interest in technical analysis?

IM: I started number one as a banker. I then became a broker working in the research department for Dominick and Dominick, which was then a major Wall Street brokerage firm. This was in 1965. Very quickly I discovered that when we published a research report, the price on the report was just one moment in time – one month later I would be talking to a client and I would be telling them, 'buy Schlumberger at 60,' and the client would say 'that's wonderful, but Schlumberger is 70.' So I started charting stocks just to be aware of the price, and very quickly I realized that when they started going up, they kept going up. If a stock came up to 70, the odds were it was going to 80. So I started just keeping charts on every stock that the research department was recommending. I increasingly got to recognize that the patterns on the charts were far more reliable than the analysts' opinion, because in those days the analyst never went negative, even when you saw a chart go up, stall, and start coming down. So I became progressively more of a chartist in the late 1960's.

J: How much time did you spend studying technical analysis before you felt prepared to use it in your trading?

IM: I am not much of a trader. I am an investor rather than a trader. I am not short term. I was publishing chart opinions for my clients I would say within one year of when I started doing it. I would take a research report, make a copy of a chart, and write a note on the chart saying 'I like this pattern,' or 'it is above this trend line.' It was very basic technical analysis. To this day I recommend to people the book that I started with, *Technical Analysis of Stock Trends* by Edwards and Magee, which at its core has very simple charts. A lot of us refer to it as the "Bible of Technical Analysis." You have to watch the charts, because everything that is known and thought to be known is in the price. Whether people know the facts, or they think they know the facts, it's in the price. Then you can also watch for price and volume relationships.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

IM: The nature of trend is something that you are always learning. I have been working with this material now for nearly 38 years, and I am still learning. There is always something a little bit different in a way a trend behaves. Simply, there are four stages to a trend: it's bottoming, it's rising, it's topping, it's falling. And, really, it's a question of continually keeping it simple. I see so many young traders who are looking to buy the open, sell the close, and they get so mechanical. They have computers screening where this morning's open is relative to the yesterday's close and to the midrange of three days ago. I don't even

understand these formulas. To me, open, high, low, close, and volume is all I need to know. I always say that when somebody shows me something, a formula that includes one letter of the Greek alphabet, I close my ears. I am anti-academic in that sense.

J: Which mistake did you learn the most from?

IM: Invariably, I develop a hypothesis, a longer term view of what I expect, and then I watch the evidence in support of my case weaken, but I stay stubborn. The market is right. The market will make me wrong and find out where my pain threshold is. It will find out when I will change my opinion. It takes a number of years to learn to be less stubborn. My favorite story would be one about an old timer by the name of Abe Cohen, who was the founder of *Investors Intelligence*, the newsletter that measures investors' sentiment. He was at a conference, and a very young fellow, who was in his 20's, was giving a presentation. It was in a bull market. The youngster stood up and started walking people through two years of charts, saying 'it crosses the moving average, you buy, you sell, you buy, you sell.' It seemed like a perfect system, in other words, there was a very select two year period where it worked perfectly. And I have never forgotten Abe Cohen going up to the podium and saying: 'I remember when I was so young, and so sure.' Now, as I am older, I understand what he meant.

5.10.2 Personal style

J: In your experience, is technical analysis more effective when practiced individually or in teams?

IM: It depends on the application. If you are using great sophistication, or covering a great array, it is probably better to do it in teams. I am a loner, I do everything myself. I follow the stock markets, currency markets, interest rate markets, and the hard (non-Ag) commodity markets. But I have it in my mind that there are no rigid formulas. I am one of those people who believe technical analysis is more art than science, where self-discipline and control over your ego are vitally important.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

IM: When you say superior returns, I don't know, I am not measured. I don't know how to measure it, because I don't try to tell people what to do. My newsletter is called *Deliberations*. Basically, I let people look over my shoulder, and see what I am concerned about. Most of my focus is on anticipation or identification of changing conditions in trend. I don't make calls where I say "sell, buy." I don't say things like "sell at 10 o'clock tomorrow morning." I don't make that kind of analysis. I am more focused toward relative change. For example, I would note that small caps have been strong, but that they are weakening relative

to large caps; that the dollar is weakening against the Euro, but that it is holding against the yen; or that gold is rising against the dollar. I am typically looking at (1) chart patterns, (2) moving averages, and (3) the VSMA ratio, which is basically price as a percentage of moving averages. The VSMA ratio is one thing I believe I originated as a chart method. It helps me identify how far price is from a moving average. For example, if a 200-day moving average is my basic definition of trend, am I too far away from it? Am I making a peak in momentum, then cooling off, coming back, making a higher high in price, but a lower high in momentum? In other words, is my trend maturing? Is the most recent strength as strong as the prior strength? So I am watching for price-momentum divergences.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

IM: Mr. Market will make a lot of noise because he does not want it to be easy. But it's impossible to determine what is random or to know precisely what is not random. I am an artist, and I am just saying the music is changing a little bit. To try to define too much I think is a mistake, and this is one of the challenges for the academia, because virtually all patterns of behavior change over the course of a trend. The simplest way to define a trend would be "anything measured by free price," because free price is a function of buyers and sellers, greed and fear. Fear is a more urgent emotion than greed. Bottoms are very easy. Tops depend on how greedy people get. So you can think of these two emotions at either end, but as you progress, it's always going to be a little bit different, and that's very difficult to quantify.

J: How much of your technical analysis is done on an intuitive and subconscious level?

IM: Probably half. I am still very influenced by what I see. If you look at my newsletter, you'll see that I am a very visual person. The issue that I have given you, my 24 page forecast issue, is probably 70 percent charts.

5.10.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

IM: Basically, I wouldn't rely on anything that is purporting to pick time and price in a short timeframe. If there is random behavior in the market, short term price forecasting or precise price forecasting becomes meaningless. I'll talk about a range of 10 percent over a period of a few months being the probable direction. That's an easy target to hit. But to try to say that S&P will hit 1142 on August the 3rd at 4 o'clock is unreliable. If somebody gets it right, they probably should have bought a lottery ticket that day, they might have made more money.

J: How is the way you apply technical analysis different when you are more cautious than when you are less cautious?

IM: I am technically always cautious. I am a cynic. Whatever the established or the perceived trend is, I am always questioning where it could go wrong. Again, I am not a trader, and I don't give precise trading advice. I look at markets a little differently from many of the technical analysts that are out there. I also marry my own perception of fundamentals – if I think that overall the market is overvalued in terms of price earnings ratio or low dividend yield, that colors my thinking to some extent. This is where I say it is art rather than science.

J: Would you say then that combining fundamental and technical approaches is important?

IM: I think it's absolutely critical. Prices move on fundamental factors, they move on technical factors. I use the phrase that prices walk on a technical leg, they walk on a fundamental leg. Don't bet on a one-legged man in a two-legged race! On balance, what do I trust more? I am right handed, that's technical analysis. The technical approach would be my primary discipline, but I am always trying to marry the two.

5.10.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

IM: When I first started, I was probably the first person in the world (that I am aware of) to overlay the international markets. In the early 1970's, I was publishing charts of Tokyo, London, Toronto and identifying cyclical patterns where Tokyo lagged North America or where London led North America. Canada, as a resource country, tended to be one cycle peak beyond New York. For example, when New York would make a market top and have its first drop, it is on this bear market rally that Canada would make its high. Actually, I published an article on that in Barron's in April 1976. It was an article in which I espoused this Canada-New York cyclical concept, and I showed charts back to the 1930's supporting my claim. John Murphy later created the term "intermarket analysis." I think I was doing it 10 years before John ever thought of the term. Again, I am always graphic. It's the overlay of the different markets that you can see on my charts. Now it's very common. I see many of what I would call my graphic presentation techniques become common practice among others.

J: To what extent do you rely on computer generated signals?

IM: In terms of signals, I don't let the computer tell me to do anything. I use the computer in pretty much the same way I use a typewriter and an adding machine. It generates

data, I interpret.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

IM: I still think it's very useful to keep a couple of charts by hand. I don't really do it any more because now I am overloaded by data, but I have done it for so long. For example, I don't need to chart my VSMA ratios any more – I can look at the table of data and visualize it. I have made so many charts over my life that I can see right away 'high, lower high, low, higher low, I've got a convergence.' Sometimes I may trace it out roughly to see where the lines meet. In my Excel spreadsheet I'll make a chart so that I can see what it looks like. I am visual rather than statistical.

5.10.5 The innovative process

J: What drives your innovative process?

IM: Almost invariably it comes back to how to express something graphically. I think of myself as a story teller. I gather vast quantities of data, and I am driven really by the pictures that I can create. I'll do ratios of this to that, and then I'll fiddle with the scale so that there is enough range that will show me if the trend is going up or going down. Then I'll throw a moving average on so that I can see if this is a reasonably projectable trend.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

IM: As I said earlier, over the years, all indicators will change. Parameters will change over a course of a trend, and this is one of the things I have learned with experience. In the 1970's, for example, there was this thing called the specialist short sales ratio, which is the percentage of the short selling that was done by the specialists. Before the advent of options trading that was probably the single most reliable ratio for about seven or eight years. But then they changed the floor trading rules so that the specialists could lay off part of these trades upstairs on the desk, not on the floor. Then options came along, and within a period of about three years, all of a sudden the specialist short sales ratio was useless, when viewed in the context of prior rules and extremities for signals.

Odd lot short sales had varying values at times. I quickly learned that with a lot of market sentiment measures, like the Market Vane or the Bullish Consensus surveys, the range of interest is constantly changing. For example, in the later stages of a recognized downtrend you'll recognize a swing up from 10 to 50 percent as a lot of bulls, but as soon as you realize a new trend is in place, your range of interest may become 50 to 85 percent in a bull market trend. It's a question of studying prior cycles in different markets, because every market will generate different degrees of enthusiasm.

I am always trying to stay away from trying too hard to define a signal level, because signal levels are always moving. I don't understand the math of constructing a Bollinger Band, but it's one good measure, because it's a continually moving measure. I want parameters that are constantly adjusting to current market. There is a mathematical term for it, essentially dynamic trend lines, or something that is continually adjusting to the latest information, but with respect for what it did in similar trend conditions in the past. It's not continually generating new parameters on its own. I spend a lot of time relating what's happening now to what happened in the last bull market, as one example.

J: Why do you share your inventions with others, rather than keeping the edge just for yourself?

IM: I would say it's largely egotistical at this stage, but my primary income for many years was publishing my opinions in my newsletter. The newsletter was my primary activity. And to me, my subscribers own my thoughts, I am working for them. I have never worked for anybody else since the mid-1970's. I've seen a few people trying to create black boxes or marketing black boxes, but I am against such an approach because (1) it lends itself to fraud if it's abused, and (2) I am very dubious of something that cannot be explained fairly simply. If someone starts explaining to me where they've got an algorithm that's far too complicated, my reaction is: 'open, high, low, close, volume, what else have you got to work with?' It's either going up or down, and if it takes you three pages to say that, I think you have a problem.

5.10.6 Emotional aspects of the craft

J: Has a big loss ever made you doubt the validity of technical analysis?

IM: All the time. Not the "validity of technical analysis" in general, but the validity of my own applications of it. Literarily every time a trend changes character. For example, just in pure charts, in a bull market you may very well go up, make a high, a low, make a higher high, a higher low, and after you've got two or three of them, you've got a visible trend. Then a trend accelerates a little bit, and maybe it makes a top, it drops, comes back, it doesn't make a new high. It makes a higher low, a lower high. It converges. Quite often in an enthusiastic trend that has already started to slope up, the last gasp will make a new high and everybody will be shouting 'a breakout,' and very quickly it will become a fakeout. In other words, the last thing the price will do is poke to a high and then break. And in an accelerated trend that actually happens quite commonly. I view the whole market as sort of a living being. It's a psychological thing. When there is enough urgency, quite often the last achievement it terms of a higher high will be the moment at which the market looked its best. And then it fails very quickly. Higher high after an accelerated trend followed by a lower low can be a particularly dangerous moment, because it can really accelerate downward from there. And it's also one of the hardest calls to make, because it is at that moment that people are saying: 'Well you always say it's bullish after it makes a higher high

followed by a higher low, now why is this a fakeout, not a breakout?' That's where the art of understanding the trend or having a feel for a trend comes in; that's where the art takes over from the science.

J: Would this also be a point where you would look at the fundamentals?

IM: Oh, I'd look at the fundamentals, but I am much stronger with my right hand, than I am with my left hand. There are periods of time when it's not easy, and in fact when it's easy, that's when you'll probably make your biggest mistakes.

J: How do you make the final decision? Is it based on you intuition at that point?

IM: Probably it is mostly intuitive. I would say most of my decision-making per se is intuitive. In producing my newsletter, I probably spend a whole day assembling and finalizing the data from the periods since my last newsletter and two days just designing the charts and marking them up. I don't necessarily know what I am going to say until I actually sit down and start writing. When I write my newsletter, I typically get up Monday morning, paste up all the charts, and then start filling out the spaces with words. I am actually making my opinion as I am writing. I have, on occasion, started off a page with a bullish presumption, with a "what if" scenario in mind, but ended up convincing myself of the opposite and finished the page bearish! But, literarily, I write it in one shot, I barely proof read it, I never rewrite it. I start Monday morning, I take it to the printer on Tuesday, and it's mailed out Tuesday night. I get up Monday morning; I go to bed Tuesday night. I am 62 years old, and I still work a 36-hour day every three weeks. I do it nonstop, and it becomes very intense, but I wouldn't do it any other way. It's a very intensive process, again, because of my multi-market approach. I'll do this section, that section, and by the time I finish the newsletter and I am driving back from the printer, somebody could ask me – what did you say? – and I wouldn't know.

J: It's like having a burst of inspiration?

IM: Oh, exactly, exactly. I force it onto myself that it is only when I get it back from the printer, that I read the newsletter. It's a very intense thing, and I've always done it that way. I always joke that I have to panic myself into the deadline to really become efficient.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

IM: When I was young my emotions interfered with my craft about 95 percent of the time, because of the "I am right, the chart must be wrong" mentality. The older I got, the more cynical I got. There is always a little bit of emotion. I am not sure that I could quantify it beyond saying that 30 years later it's the opposite. When I first started, I was

trying to tell the market what to do. Once I formed a hypothesis, I thought that was what would happen. The first thing you learn in the business of publishing investment opinions is never to use the words "will," "for sure," or "never." Because if you say this has never happened before, you'll have one next week – it's like a hundred year event in the mining industry. The minute somebody says something can't happen, the only absolute law of the markets, which was written by an Irishman called Murphy, will manifest itself: if anything can go wrong, it will.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[16]*." To what extent is this statement true in your case?*

IM: Oh, that's always the case. It's not so much reflected in my newsletter, in my writings, but it's very much present in my personal trading. Because of my long involvement in gold and gold mining – I financed a lot of mining companies – I am an adamant speculator in the penny mining stocks. And, you are always fighting with yourself. Again, over time, you develop a discipline that when the trend is rising, you have got to sell into strength. If you are trying to make money, you don't wait for it to get weak to sell. Technically, you have to wait for it to get weak to confirm that the trend has changed. So from a trading point of view, if the volume and price are there in a relatively thin market, you have got to sell a little into it. I quite often find myself hating to sell into it. But a very simple way of putting it is that when the ducks quack, you have to feed them. If the trend is rising, I sell a quarter of the position. Then I sell another quarter of whatever is left of the position, so I am continually trailing it in. It's like a half life. So, by sheer coincidence, I may actually have a sale very close to the actual high, and a buy at the actual low. If I actually did get it completely right, it would be totally by accident. But I am trying to sell through tops and buy through bottoms. I typically tend to be early.

5.10.7 The role of creativity

J: We've talked about the role the creativity plays in technical analysis. Can this creativity be learned?

IM: Oh, yes. It can be learned and it is learned by anyone who is reasonably successful. But, there is no way that some neurosurgeon could sneak into my head and say, 'OK, we've got everything he ever knew,' plug it into a white rat, and give a white rat a hedge fund. Again, there is the art relative to the science part to it.

J: How would you define the talent for technical analysis?

[16]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

IM: I am certainly not one of the most talented. I think of myself as a graphic, visual artist and a storyteller. I am a storyteller of the markets. Over the years, I've seen a number of technical people who go through periods of being tremendously precise, but then they average it out. Bob Prechter of the Elliott Wave, whom I've known for a long time, has had these periods of several years when he was hot. It's as if he would call up the market and say, 'here's what price you will turn at.' And he would go through a period of a couple of years with extraordinary calls, within 1/32 (one tick) in the bond market. He would pick the day and the price, and Mr. Market would say, 'OK, Bob.' And then, all of a sudden, it turned upside down. That's why I say, with that kind of precision you can all of a sudden find yourself not being able to hit the broad side of the barn door. But it is wonderful to watch a short term forecaster when he is hot. Think in terms of baseball. You pay a guy millions of dollars to hit three balls out of ten. It's not a whole lot of fun watching him hit the other seven, but he fills a lot of ballparks, because people go there to see the three. (I'm not knocking Bob's work. I use him as an example because over the years I have seen him have some of the hottest hot streaks that were unbelievably precise and persistent.)

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

IM: I am far too cynical about the entire scientific and academic approach. Artificial intelligence essentially is doomed to not work, because a market is an ever self-correcting process. It will work for a while. I see a lot of chaos theory, people developing their fractals, which they get to fine tune down so that they might get 5 great calls in a row. It will get them in time, because the market will change its behavior unpredictably. That's the fun of the market. Otherwise it would be terribly boring and not very rewarding, because if you can develop an artificial intelligence model that beats the market, be assured there is somebody looking right behind you, who is going to do the same thing. Then they would take all the volatility out of the market, and trading would become as exciting as owning treasury bills. If there is no volatility, what's the point? To me, artificial intelligence will never control the market. It will be an influence, but no different from when George Soros, when he is getting a lot of publicity, has some influence for a while, but only for a while. I don't know that artificial intelligence models can replace a human. They certainly can fulfill a lot of the human function, in the sense that as the markets are getting segmented into sub-indexes, the ETFs and the subgroups, the machines can do a great deal more than any human can. They can always be optimizing, searching for optimal moving average combinations, screening for signals that have varying predictability. In that sense a tremendous amount of human labor can be taken to a much higher level, because so many more computations and so many more bets can be made. But, at the end of the day, I am not sure I would be comfortable with an IBM computer that said "go buy" or "go sell." If it's Tuesday, you push the blue button; if it's Thursday, you push the red button. Somebody will put some money on it, but it won't be me.

5.10.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

IM: Luck has a very significant role in human life. If you walk across the street, you made it. Sure, there are traffic lights, you look, you make some judgments. But, there are people who can make all those judgments, and just as they blink, a plane falls out of the air. I think luck is ever-present to some degree, but it's certainly not dominant. I've often heard Mike Epstein, my old pal, saying he would rather bet on a lucky guy in terms of short term trading, and I think he is very right. All of the guys that he is working with are going to be qualified to some degree, very good at what they do, but every once in a while, one is going to be a little better than the others. And it's not because suddenly he got up one morning smarter. It's because he got a little luckier.

J: You've mentioned how certain people go through periods of being tremendously precise, for example, Bob Prechter of the Elliott Wave. How is that possible? Is that luck?

IM: No, no. It's the adherence to a specific discipline, Elliott Wave theory and Gann analysis being but two examples. In the Elliott Wave theory, there are stages of five waves, each of which is subdivided, and at certain stages there may be more predictability than at other stages (in my opinion), depending on where in the trending process you are and on the nature of the trend at that point. I have seen periods in the past where Prechter, quite literarily two months ahead of time, would say that this trend would do that tick. He would say, because of the duration of the previous leg, this trend would be of this duration. In the 1970's, there were periods when the interest rates were in the late stages of the Elliott Wave, probably leg 4 or leg 5. There were literarily periods when his market opinion would say things like 'next Thursday, X will be the optimal number,' and the market would do it. There may have been a slight element of some self-fulfillment, because of traders watching it. There are a lot of ingredients that go into it, but I would never dismiss it just as luck.

This is one of the difficulties with a lot of the technicians who want academic proof. Academic proof requires a huge amount of data. Any statistical testing is going to say, give me a 100 years of data. I'll point to that 100 years and I'll identify about 40 different phases that you can't possibly quantify. It doesn't lend itself to full statistical rigor in what I would call the 'mechanical engineering sense.' That, again, comes back to art, because it's psychology. It's like in medicine, where there is a healthy temperature for a human body. It can be a little bit warmer, a little bit cooler, but there is a threshold point where that fever suddenly kills you. You can get awfully close to it and just have a headache. But, mathematically, somebody is going to say: you are healthy, you are sick, you are dead. Now, I may have a higher pain threshold than somebody else. To try and define it rigidly defies the fluid and the artistic nature of the way the human psyche works. The market is nothing but people acting like people.

J: So these techniques that we have just talked about work very well over certain short periods of time. What exactly makes them fail other times?

IM: Different trend conditions. As I said, bottoms are made by urgent fear. Tops are made by greed, but greed lingers over longer periods of time. Think about it this way: you are likely to have higher velocity around the bottoms, and you are likely to have lower velocity on the highs. So we are not only going from low price to high price, we are also going through velocity changing characteristics. Elliott would be one way of trying to quantify those characteristics. I am a simple chartist – for me, a higher high continues the trend, a higher low says the trend is still intact, and I throw a moving average on it. Now, the trend is going to be changing its character all the way from the bottom to the top. What worked in the first leg may be quite different from what would be optimal in the last leg. If we have a trend that's 3 waves up and 2 waves down, the first wave and the fifth wave are likely to be very different. The trend is imprecise, may be choppy, and is varying as we go, so to try to specify precisely what is right or wrong will not always work. And this is the problem in the case of Elliott. I am not an Elliott person at all. I respect Prechter, and I am aware of a lot of the research that he has done. I think it's a marvelous attempt at trying to quantify the nature of trend, but since the trend is imprecise, the theory will not always be precise, in my opinion.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

IM: Only in the eyes of closed minds. I actually published a paper on the impact of the full moon on the stock market in the early 1980's. When they first launched the listed option and futures trading, I said 'this is going to be marvelous – I can finally trade stocks on 1 percent margin!' In those days, there were 50 percent margins. So my reaction was, on 1 percent margin – that was like leveraged trading in currencies or bonds – I only need to win by a small amount. On one percent margin, if I can get a three percent move, I am rich. So I asked a friend of mine to get me the dates of all the full moons and new moons. The full moon is particularly interesting to me, because I went to hospital emergency wards several times around the full moon. We always hear the doctors talk about it, but I happened to have an accident, and I was in there on a full moon. I can assure you that the night of a full moon in a hospital emergency ward is very different from the Tuesday before or the Tuesday after. If moon can move the oceans, it must doing something to us - after all, human body is 90 percent fluid. And then there is the whole concept of lunacy. So I took 15 years of "this is the night of the full moon, this is the night of the new moon" data, and I approached it on the basis if the full moon does one thing, the new moon should offset it, because then we start another cycle. Then I measured the changes in the market, that is, I listed the daily change for each of the 10 days before and after the full moon - I used the Dow. And I did exactly the same thing on either side of the new moon. I did this by hand. I found that from

the night before full moon till the third day after the full moon, I could sell short, cover the third day after, and on that short sale win more points than I lost on that short sale. It only worked a little over 50 percent of the time, but when it worked, it substantially exceeded the costs of when it didn't work. So a statistician would say it only works half the time. My reaction as a market person is, when it works, it pays, when it doesn't work, it doesn't cost me much. It was less distinct on a new moon, but I always felt it had to offset. On a new moon I had a broader discipline, 5 days before the new moon I would buy, and I would sell 5 days later. I used to do a lot of television, commentary. I was always outspoken, and I never took myself or the business too seriously. There was a talk show in Canada called the Shulman File. Morty Shulman had an opinion of himself that was difficult to share. He was very arrogant. He loved attacking anybody who thought they knew what was going on. I was one of the few guests who would go back regularly, because I enjoyed fighting with him on air. And his producer loved me, because I was one of the few people who would stand up to him. I challenged him on the air. When I told him I had published this full moon paper, he thought I had gone right over the deep end. And I proposed a bet, I documented a bet. I said, it's not reliable enough on one cycle, but I'll bet you a thousand dollars that over 6 lunar cycles it will work. I will short the market the night before and cover the third day after the full moon. And I'll go long 5 days before the new moon, sell 5 days after, and I'll give you one point transaction cost on each trade. So I am giving away 2 points per trade. I am incurring transaction costs. I said, it's not reliable enough on any one cycle, but over 6 full moons and 6 new moons, I'll make a 1000 dollar bet. And I won. According to the bet, he had to pay me a 1000 dollars in cash on the air. He said you were lucky because Mr. Volker cut interest rates, and this happened or that happened, and sure enough, of the twelve trades, I probably made most of it on three or four of the 12. But I didn't lose big. Statistically, it's lousy, except it worked. I did a second and third bet with him – I won all three of them. My greatest legacy from Morty Schulman, who never had a good thing to say about anybody, is that, after I won the third bet, he closed the show by saying, 'Don't bet against Ian McAvity, it's expensive.' And he refused to pay me on air for the last one. I am trying to find that old full moon study, I have it somewhere, I've got copies of it. To this day, when I am active in the markets, I am always looking at the count – full moon, new moon. What is it? And it's within that model that I am thinking. I am not sure that I would completely change the trade that I might be about to make, but it would be an influence. If today I am thinking, 'well, it's moving up and up and up, maybe I'll sell some next week,' and then I see that tomorrow night is a full moon, it's like, 'well, maybe I'll sell this afternoon.' Or if I am thinking of buying something, it's like, 'well, let's wait two days.' It becomes an input. I like the bank calendars that I get in Canada that have a full moon and a new moon shown on them. They are useful reminders. I stopped tracking it closely about a year after the S&P futures got going. In those early days the premium levels over spot were highly variable, before that market became "smarter." I found that my model would work on the cash indices, but lose money in the futures because of premium to spot variability around the full moon!

J: Is this the only kind of astrological analysis that you use?

IM: Yes, that's the only thing I've ever done. I've never been smart enough to understand all the other business. Arch Crawford, who publishes *Crawford Perspectives*, is an old friend of mine. And Arch is always trying to explain to me how you get to that third dimension, and how you have Venus, Mars, and Jupiter, and all these various lines. Again, it's like with the real estate - that's a specialty I leave to somebody else.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

IM: I would say that it's not so much that they have got an enormous faith in it, I would say that they are specialists, and they seem to be able to utilize it much, much better than other people. The sad thing is, sometimes the best advertiser is not the best practitioner – that's the nature of the financial industry. An advertising company can be terribly convincing, and some people write very good ads. But I've got great respect for a few that I regard as legitimate. Over 30 years I have seen more than my share of illegitimate people come and go. To me, what Prechter does with the Elliott Wave is highly legitimate. I disagree with him a lot, but I have a lot respect for his discipline. And I am amazed sometimes, when he is in phase. I think of it as being in gear or in tune with the market. I am not quite as impressed by Gann, but it seemed to work in shorter term commodity trading, over the years, particularly in the 80's when we had sufficient volatility. A lot of this stuff will work better in a volatile market. To use an old argument, take a rifle or a shotgun, and hit the barn door. Normally, it's easier to hit it with the shotgun, but if you've got great volatility, you've got more tools to work with. As for Gann, I've seen periods where some people would literarily pick time and price levels, which would then materialize. I don't grasp it, I don't track it. I've done very little work with Gann. But from time to time, I meet what I would call "Gann people" in whom I get interested. I am completely open. I don't want to be rigid. I do believe that there are some underlying cycles that are reflected in price and volume. And Gann, Elliott, astrology, those are all methods for trying to pinpoint price with time. But time within markets, in my mind, is an artistic judgment, not a mechanical judgment. These are people who use their own mechanics, sometimes with great success. I am very impressed with it. I don't use it nor rely on it. But I want to know what they are saying, in case I am at a point where I can be persuaded one way or the other and where I am looking for one more piece of evidence.

J: So all these principles that they are using, are valid principles that underlie market action?

IM: When you say valid, in my mind they are valid if we are in the period in which I

sense that the person who has expressed that opinion has been good lately, in other words, if his trend is good. If somebody that I've never heard of before writes an opinion that comes to the Internet, it's not likely to have much of an impact on me. But if I have been watching Bob Prechter have a series of good calls, I am very interested in his next call. If I have seen him having a series of bad calls, and I see a call that strikes me as being different in nature, and suddenly he is suggesting something that may be agreeing with something that I am looking at, then I am very interested in it. I don't know, I don't have a balance pin that says 'this time is this, this time is that.' That's why I call it an art. And art, basically, is an accumulation of experience. And that's always changing. You could never bake the same cake three days in a row in that sense. In many ways, that's how I feel about the market.

5.10.9 Level of conviction

J: Have you always been convinced of the validity of technical analysis?

IM: I've always been convinced of the validity of various parts of technical analysis. In the earlier stages, I would get too set in my ways, and would refuse to recognize that characteristics of some things were changing. Over time, I've become much more respectful. People use the term technical analysis as if it is very definable. In my mind, it is very undefinable, because market ingredients are always changing. There is always a different ingredient, and this invariably comes back to the fact that an ingredient is a reflection of changing market sentiment or changing price, but not necessarily a reflection of the change in what people would call the fundamental rationale. Over the years I've seen that, when it comes to forecasting financial markets, the single most consistently wrong group of people are the economists. People talk about leading and lagging and coincident indicators, and the economists cannot even construct a leading indicator that works and a lagging indicator that works. And if they can't measure what has already happened, that I think is a problem. Just remember their declaration of the last recession. They declared it over on the day they recognized it! That was really useful information! OK, it was useful, but only from the point of view of the human psyche's need for understanding and having a rational reason. The law of the investment markets supplied the prudent man rule, which, the way I view it, says that it is perfectly OK to lose money, as long as everyone else in your peer group loses it the same way. My reaction is, if you are afraid to take risk, you are afraid to succeed.

J: Did you become more or less convinced since when you first started?

IM: I would say I've become much more convinced over time, in large part, because I've broadened my horizons. Early on, I would go through phases, where I felt I could define precisely what the market trend was. And whenever the market disagreed, in my mind as a young arrogant beginner, the market was wrong. Over time I've learned to recognize that the market is always right. The question is whether or not I can recognize what has changed and adapt.

J: Which special moments of your career have been critical in determining you level of confidence and conviction in the validity of technical analysis?

IM: Again, I would not put it in the generic context of technical analysis. There have been various turning points. For example, I have been very much involved in major trend contrary opinion. There were points in time where I have made a great deal of noise, with a very high conviction level that what I was seeing was unsustainable and that therefore it was practically over. Most recently, that happened with the decline of the dollar. At the end of November, when the Euro was at 85 cents, I said it would go down to about $1.20; and later on it would go to $1.40 or $1.45. The adamancy with which people disagreed with me when the Euro was 90 cents had me very convinced that what I was calling was going to occur. Now, let me fast forward. In the last three months, now that the Euro has gone though $1.20, suddenly it's become respectable to say it's going to $1.35. Well, it's basically met my initial objectives. Now that I see this great growing conviction, I've become increasingly adamant over the last two months that the market is about to turn. The dollar is going to bounce. I don't trust the dollar, I don't like the dollar, I think it's going to go lower later, but it's not going lower now. And the same with gold. I am gold bug, I am involved with a gold fund, this is sacrilegious to me, I am not supposed to express warnings on gold. I always remind people that I am like a theologian on one hand, a gold bug that preaches the religion of gold, but I am also a disciplined analyst, and when the market is up, it should be sold. In a sense I've been vindicated already. If a dollar is going through a turn, then gold is going through a turn. In a sense, it's contrary opinion, the strength of consensus. The more opposition I get to me is very important in making me feel very strongly. If I am alone in a position that I am comfortable with, that's probably my highest conviction. When an awful lot of people are saying 'you are so smart and we agree,' I get very nervous. As the population of consensus grows, I tend to want to go opposite. You can't really quantify contrary opinion, beyond some statistical measures and surveys, but, for the most part, it comes back to identifying the herd. Too many people try to go contrary to everything they previously believed. The tide came in, the tide goes out, therefore it must go up. Identifying what to go contrary to is often a major challenge.

J: Have you, with time, become more confident of your ability to beat the market?

IM: I think so, but I have a luxury that many people in the business don't have: I am not paid to play. I only trade for myself and family. I am not trading for the public. Somebody who is in charge of a mutual fund or a hedge fund is paid to play. I respect the fact that when somebody is uncertain, they'll go to hundred percent cash and make no decisions. They'll explain to their investors that they are hundred percent in cash, and they'll be paid to guard that cash in anticipation of the next successful trade. I think that's the most admirable position that they could take, but the odds are pretty good most of the money will leave the fund. People buy the fund because they want and expect the trading. Most people

will end up forcing opportunity where none exists. And in a sense, what probably damages most performance records is people who have very good streaks, but who then basically start trying to beat a dead horse. They are good in different phases and different cycles. I have the luxury of "I don't care." I don't have to play. I trade mostly Canadian penny stocks these days. I don't think I've traded a New York stock in several years. (For me there are also tax considerations. I am Canadian. I don't like this little buddy called the IRS having anything to do with my lifestyle.)

J: Did the lack of credit many academics give to technical analysis ever discourage you?

IM: I love watching what I would call the main stream technical school, people who are working for funds, working for brokers. They get themselves so worked up over the fact that nobody respects what they do, and that some professor somewhere said that it doesn't work. They get so agitated about it. I could care less about what the academic community thinks. It doesn't matter at all to me. But again, I am not publicly accountable beyond whether my subscribers renew or not. The Wall Street analyst looks at the CFA in the research department, and he thinks that the CFA is getting an extra 10,000 dollars a year because he's got the alphabet soup after his name. I am a college dropout. I dropped out of college after one year. I didn't finish the first year. I thought it was a waste of time, I was going to go into the money business, so I went to work for a bank. I really sound like the old bank robber - when they asked an old bank robber 'why do you rob banks,' he said 'that's where the money is.' And I went to work for a bank. I didn't know what part of the financial world I wanted to work in – all the money goes though the bank, so I did my four years of university at the Bank of Montreal. As a result, I ended up on Wall Street, because that was the most interesting thing that I saw. But, no, what other people think of my work is their problem, not mine.

J: What, in your opinion, is the best proof of the validity of technical analysis?

IM: Again, I have a hard time with defining the "validity of technical analysis." There are so many different forms of it, that in my mind are different. The best proof of the validity of anything is the results. Show me the results. If you tell me that those ingredients make a cake, let me taste the cake.

J: Did you find that your experience with technical analysis contradicted statements made in books?

IM: Due to the changing nature of trends, as I said earlier, I've contradicted myself between the first paragraph and the last paragraph in one article. It's the matter of the changing nature of trends. Whenever somebody tries to make it too mechanical, too constrictive, that's an invitation to breaking the parameter. Whenever people try to make it too precise, or project an artificial or exaggerated success ratio, they are bound to fail. Paint with a broad brush! You can always fiddle the statistics to prove anything you want. And, unfortunately, too many are very good at the fiddle.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

IM: There are no hard and fast rules, but, again, a successful person will recognize that. A successful person will recognize the there are periods in which some tools are likely to work better than in other periods. That's very important. For example, within the broad indices, everyone hates the Value Line geometric average, because a geometric average apparently has some statistically negative bias. Well, that's fine. For me the Value Line geometric average is a wonderful tool to use at the bottoms. They tell me that it has got a negative bias to it. When I saw it falling at an accelerating rate, I thought that's pretty impressive. As a net result, I basically turned bullish within two days of the bottom, in October 2002. I was looking at the value line geometric average fall below its 200-day moving average to a level only seen three times in 50 years. The comment that I put out was, "if the world is coming to an end, it doesn't matter, BUT if the world doesn't end, this is going up." It was just in that kind of the context. It wasn't because it hit any magic level, but when I looked back at the 1974 bottom and the 1962 crash, I said, this is only the fourth time it's been 40 percent below its 40-week moving average, or its 200-day moving average. It is very rare for me to be in that kind of decline, and go actually catching falling knives, trying to pick a bottom, but that had such a perfect velocity fit. That's why I phrased it the way I did, "if the world doesn't end, this is it."

J: Do you feel that with the help of technical analysis you can makeup any loss, regardless of how large?

IM: There are a couple of losses that would be very difficult to make up. If you lose 99 percent, you have a lot of work ahead of you. I don't know. Partly because I don't manage other people's money in that context, I don't think in that kind of terminology.

J: Do you believe that technical analysis works even when applied to data other than the market action data (e.g. the weather data)? If yes, how is that possible? If no, please explain.

IM: Sure. On anything that is legitimately variable. As far as the weather data is concerned, once you identify the seasonal norm, you can very quickly throw a moving average on it, to see whether or not you above or below the seasonal norm. Let me take that weather data one step further. Suppose I am looking at every day in July, and I have a moving average of what an average July looks like. Now suppose I am in this year's July, and I am seeing that I am 3 percent above the last year's number. Suddenly, I am 4 percent above the last year's number. Then I can start to think that maybe August is going to be warmer. Maybe I have an accelerating trend. In the 70's and the early 80's I was tracking consumer price indexes of various economic series. I used to put 12-month moving averages onto the unemployment rate. Then I started looking at the second derivative, the rate of change of

the moving average. To me that's a technical discipline. I always laugh at the fundamentalists. They talk about projecting the economy in percentage terms - but that's technical analysis! That's what it's about.

J: Can the continuation and reversal patterns be sensibly applied to the data other than the market action data?

IM: I don't know. Well, it depends on the variability of it. For example, it might work on a lot of water flow data, if that water flow is subjected to temperature changes. As with the market, there are always changing ingredients in the mix. Head and shoulders pattern, as one example, works in terms of identifying changing condition in the trend of interest rates. Show me a head and shoulders reversal pattern on a 10-year treasury bond, and I can make a fortune. I find it very reliable. I saw Dr. Lo's talk years ago - when he defined the head and shoulders pattern, I was the guy in the back of the room who stood up and said, 'you are all wrong.' Namely, the pattern did not include the resolution of the pattern. But you have got to break the neckline. What he identified was a six step pattern that had some forecasting value, but it was not the head and shoulders pattern, because it is not a confirmed head and shoulders pattern until the neckline is broken. But it was wonderful work. In fact, his response to my question was that what I was asking for would only add another 100,000 computer hours or something like that. I would take that work and I would apply that work as readily to currency markets, to interest rates markets, to commodity and precious metals markets. I've never worked with the soft commodities, but in my experience with the hard commodities, and the oil price, maybe some of it is self feeding or self sustaining, because everyone thinks other traders know about a head and shoulders pattern and are trying to anticipate it.

J: Going back to the patterns, to what extent do they capture something about the market that is a function of the human psychology? If most of what they capture is, in fact, a function of the human psychology, then how could they be applied to the data that does not contain this human psychology element?

IM: That's true. If you are going to compare any data with the market data, that other data has to include the human element. I was fascinated by the work of an old friend of mine who died years ago, Iben Browning, who studied the predictability of the volcanoes and earthquakes. That's fascinating work. But I am not sure that I would look for a moving average on volcanic activity.

5.10.10 Lifestyle

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

IM: To forecast future price movements? I think trends are predictable without being too precise. The old joke is, in terms of forecasting, never put the price and the time in the same paragraph, which means, never try to suggest that next Thursday at 3 o'clock this would be the price. I have very little confidence in that. But I can identify a trend that would appear likely to continue, based on cumulative characteristics.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[17].

Would you agree with de la Vega? To what extent does your trading control your life?

IM: I am the antithesis of that. For example, if the market is open and is doing something that I am anticipating, it's at a critical juncture, and I have a tee-time at the golf course at 11 o'clock, I'll find out when I get back from the golf course what happened that day. And I am able to do that because I am not going to put myself in a position where I can blow up while I am at the golf course, because, again, I am not paid to play. When I retired from the mining business in the mid nineties, I put out a letter that said I was retiring. I said that I would only continue doing my newsletter and that I would remain as a director of Central Fund, the Gold and Silver Bullion Fund, because that's more of a trustee's role than a trading decision making role. My primary ambition right now is to work on my golf game in the summer and on my skiing in the winter, and when I have time, I'll decide what I want to be when I grow up. If you take life too seriously, you are arranging to shorten your life. But I know many people who have that kind of compulsion. I see a lot of people who are like that. The ones that are most compulsive will typically burn out very quickly. Again, this comes back to the assurance and the arrogance of youth. If you go down to the floor of Chicago bond pits, you'll see how many 60 year old traders you'll see on the floor. You'll see an awful lot of people who are 20 or 25, with a lot of bruises and very sharp elbows. And many of them are working for the 60 year olds, who graduated from that floor a long time ago. It's the nature of the business. But, you know, some people are compulsive. Put it this way: if I had a compulsion, it would be to that degree, but more focused toward making sure I had the right red wine, just the kind that I want to have after I play golf. To become that compulsive, to me is not attractive at all.

J: Could you give me a brief description of your working day?

[17]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

IM: I spend a tremendous amount of time just gathering data. And since I got going, I was trying not to get dependent on computers. I am now basically an attachment to my notebook. I am continually behind in updating things that I have done at one time or another, because I found a data series that interested me. So I spend hours gathering data, God knows how many hours, I have no idea. But if I have an idea and something has got me interested, I'll work on it for 25 or 30 hours. When I write my newsletter, I live on cookies and coffee. I am a heavy smoker as well, so I started a radical medical thing a couple of years ago called chelation therapy to get the plaque out of my system or, as I say, to make the sludge move. For example, I started my last forecast issue Sunday, I got it to the printers Thursday night, I had 5 or 6 hours of sleep that week, I smoked 2 cartons of cigarettes, I ran out of coffee twice, and I remembered the medical person saying it was important to have some protein, so I think three times in those four days I had a hot dog. When I am interested in doing something, I won't bother to eat and I'll forget to go to sleep.

J: It's a very artistic kind of lifestyle.

IM: Oh, yes. But put it this way, it has also gotten me three divorces over time. I found that it only really works when your roommate is a cat. I could never live with a dog, as an example, because a dog has to be watered two or three times a day. With a cat, every few days you change the litter pan. If a cat thinks the litter pan should be changed sooner than you do, it will make a little deposit beside the litter pan to make sure you look ... I am utterly disciplined in gathering my daily data needs. However drunk or tired I might be at night, I will pull off the net the stuff that I can only get tonight. But the rest of the time, if it's a nice day, I'll play golf. I've got some other responsibilities because I am a director of a couple of funds. Where I have public responsibilities then, obviously, I take those responsibilities very seriously. But that's also why I don't want too many public responsibilities. (In the early 1990's, I was a director of about 15 public mining and exploration companies that took up a lot of time, and required all sorts of regulatory filings that crimped my ability to trade them. So I got off all those boards. I'm now down to two passive bullion fund boards – CEF on the Amex, and Central Gold-Trust on the TSX.)

J: Your creativity seems to come in bursts.

IM: Oh, very much.

J: After you work for a couple of days, do you take a couple of days break?

IM: No, I never take a complete break. Every day or night I have about two hours of data gathering/downloading, wherever I am. The concept of a break to me is, 'I've had nothing in the bond market this week, oh, look what gold did.' I am always playing with data. But again, there would be various periods in the summertime when I would be bored – markets would not be at the stage where I'd be getting any signals or any intensities –

and I would say, 'it's nice and sunny now,' and I would go play golf for a couple of days. At the end of this month, for a 23rd year in a row, I am going skiing in Zermatt for a week. I don't particularly like the skiing in Zermatt, but I love the scenery and I love sitting around having lunch in the Swiss mountains. If I want to ski hard, then I go to Idaho, or Colorado. I am very self-indulgent. I have ex-wives, divorced and paid off, no kids. So I've got no obligations to anyone. The only obligation I have is to my nephew, who will be the executor of my estate. I've promised him there will be no overdraft the day I die. And I told him, 'don't start counting the chips, because to me a part of a successful lifestyle is making sure I don't leave you too much.' I am of that 60's generation that says 'live well and die.'

5.10.11 Advice

J: What advice would you give to technical analysis students? What is the key to success?

IM: The key to success is to always have an open mind. Don't try to tell the market what to do. I don't care what statistical test you've made to prove that something does or doesn't work. At any point in time, there are all kinds of influences, and I would defy anybody who says that they know of all of the possible influences that have an effect on price. The biggest hazard would be what I call the arrogance of youth. If somebody is going to be sufficiently arrogant to say that they've quantified every variable, I'll bet against them. The market is a tableau that's in constant motion – appreciate it as such. Develop edges, techniques for identifying trends, characteristics of trend, relative volatility. Some people don't have a strong stomach. Well, don't play options on junior gold stocks if you don't have a strong stomach. If you have a weak stomach, then you buy treasury bills. Now, risk is tremendously varied, well study it. And the key is, don't ever believe that somehow this time is different. It's always different, but it has a remarkable number of similarities to comparable conditions before. Fear and greed are very basic. Markets have changed because margin requirements are higher or lower, which may enable more or less volatility. Don't try and put a color on the market. It's a breathing beast. It's a good horse, ride it. Anyone who thinks that a horse going around the track three times is a mechanical measurement doesn't understand it. The horse's heart has a lot to do with it. And there is no way that you can plug a computer into that horse's heart to figure out why that horse was that little bit faster to win. Recognize that, accept it, respect it. But still play, to the best of your ability. Perfection will never be achieved. In fact, it never can be achieved, unless you just made your biggest winning trade, or sunk your greatest putt, and then died. That was the peak of success in your career, but you had to die to prove it. If you are still alive, you can do better next time.

5.11 An Interview with John Murphy

5.11.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

JM: Actually, I did not set out to be a technical analyst. In those days it was not a job, but something you kind of fell into. I got a bachelors degree in Economics, and I wanted to work on Wall Street primarily as a security analyst, because that's what I knew about. I did a round of interviewing, and one fellow who interviewed me had just become a portfolio manager with a very large company. He was sort of a technical analyst. He kept charts, but he was a little bit of both. So he said, 'Well, I need someone to come in and do charts for me and just help me with that.' He said that was a good way to get started and get your foot in a door. 'And then,' he said, 'six months or a year later, when you are ready, you can move into a fundamental area.' So that's how it started. I started keeping his charts – there were bar charts and a lot of point and figure charts – as well as a stock portfolio. I just became very fascinated by it. In fact, I read every book, though there were not a lot of books then. There were only two or three really good books out there, like Edwards and Magee. I took a course at the New York Institute of Finance that Alan Shaw and Ralph Acampora taught, and I became so fascinated by it that I never did move on to the fundamental area.

Interestingly, about two years after I started, in the late 60's, the stock market went into a decline that lasted for a long time. My firm started laying off the staff, and I was probably the most junior person there. So I got laid off, became unemployed, and started looking around for a job. No one was hiring in the stock market area. Then, just by accident, I saw an ad for a commodity analyst with Merrill Lynch. Again, they were looking for a fundamental guy, but I was pretty desperate at that point as there weren't a lot of jobs being offered. So I went in there, they looked at me, and one of the guys said, 'I see you have some charting experience.' I said, 'Yes, that's what I would really like to do.' He said, 'We have an opening for a chartist here.' I thought, 'that's wonderful,' and I remembered Alan Shaw telling me in one of his courses that you can use technical analysis for commodities. That's how I wound up at Merrill Lynch in the early 1970's.

As luck would have it, although the 1970's were not very good for the stock market, they were great years for commodities. We had hyperinflation of oil, grains, and gold went to 800 dollars – it was a great decade for commodities and I just happened to be in the right place at the right time. That's how I got started, and then, later on, I gravitated back to stocks. Interestingly, not a lot of people have both a stock market and commodity experience. Commodities were originally just oil, gold, port bellies, and things like that, but then the futures changed. They started to introduce financial futures, like currency markets, bond futures, stock index futures, commodity index futures, so we were trading everything at that point. Then I gravitated back toward the stock market. So I sort of started by accident, actually.

J: Did the person that you mentioned in the beginning also inspire you to get involved

with technical analysis?

JM: He didn't inspire me so much as he offered me a job. He was sort of a combination of technical and fundamental. He liked to look at charts, and he needed somebody to do his charts for him. So I don't know that he inspired me as much as he offered me an opportunity, and I certainly give him credit for that. One thing that I found, though, is that it takes years to become a security analyst, and there are a lot of things that you need to learn. One thing that I was pleasantly surprised at was that within a year of learning how to chart, I was attending the meetings where they were discussing the stocks, and he was asking for my opinions. I was able, with some degree of confidence, to give opinions, and I was very impressed by that. The fundamental people that were there I think respected my opinion. I would just look at the charts and I would say, 'well, you have a breakout here.' Or one of the security analysts would recommend buying a stock and I would say, 'Gee, that stock is in a downtrend,' and they listened. And that was interesting, the thought that I could get involved in the investment process, without going through all the fundamental stuff.

J: Was there any particular person there who inspired you to get involved with technical analysis?

JM: No, I don't think there was. I would certainly credit Alan Shaw and Ralph Acampora with the course that I took where they formalized it to a large extent. They've been teaching at the Institute for many, many years. I wound up teaching a futures course there several years later. So I guess I would credit them with really getting me started.

J: Did you have a mentor? What was his or her role in your development as a technical analyst?

JM: No, not at all. The Merrill Lynch technical department was very small at the time – and I am talking about the commodities department, not the stock department. The fellow who was in charge of it was an Elliott Wave theorist, that was his specialty, so I learned that approach early on. But there was not any one person who influenced me. It was just the idea that I liked the approach – it made tremendous sense to me and I liked the precision of it. Security analysis is very vague a lot of the times, but there was certain precision to technical analysis that really appealed to me.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

JM: In those days – and this was over 30 years ago – most of the learning was self-education. There were maybe only two or three books out there that I can think of: Edwards and Magee, Bill Jiler's *How Charts Can Help You in the Stock Market*, a couple of point and figure books, such as the one of them by Alexander Wheelen and another one by Abe Cohen who started the chartcraft method. And then I took one or two courses here and there,

but after that it was largely self-education. There was no Market Technician's Association. Everyone was kind of scattered and there was not a lot of sharing of ideas. So it was very much a matter of self-education back then. Now it's very different. We have the MTA, we have meetings, we have newsletters and journals, people write articles, we have books (some of which I wrote) all over the place. It's much easier to learn about it now.

J: When you say self-education, do you mean learning by doing?

JM: They did not have a lot of classes, so you would learn the basics by reading the books. But, when I got into commodities business, that posed a problem for me, because every single book that had been written on technical analysis that I was aware of, had been written for the stock market. In fact, in Edwards and Magee, which was considered a classical bible of technical analysis, it says very clearly that these methods probably don't work in the commodity market. So I had to improvise, and I wound up teaching a course on how to apply technical analysis to commodities, and then I ended up writing a book called *Technical Analysis of the Futures Markets.* It's the same basic approach, but you have to do some things differently.

J: How much time did you spend learning technical analysis before you felt prepared to use it with real money?

JM: I would say I started using it with real money very early on. I started in 1968, I joined Merrill Lynch in 1970, and by 1973 I was in charge of their technical commodities department. Even a year or two before that, I was making recommendations that went all over the newswires. I was not trading the actual money myself, but if I thought the time was good for buying gold, for example, I would make a recommendation that would then go out on newswires all over the world. That was a lot of responsibility after only two or three years, so I learned very quickly to apply these things. As you do it, you develop a track record. In the early going it's a little scary, because you are so new to this. But that's the beauty of charting, the idea that the rules are there, and that, if you follow the rules, you cannot go too far wrong.

J: So you spent about 2 or 3 years learning technical analysis before using it with real money?

JM: I would say maybe 3 or 4 years, and then by 1973 I was actually making most of the recommendations.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

JM: Over the years I've studied most theories on technical work. As I mentioned, I stud-

ied Elliott Wave very early on. In the late 70's I got into cycles work based on Jim Hurst – I went through a cycles phase. And then I went through a system building phase, where I traded systems. So over the years I probably dabbled in just about every theory. The only one that I never really had a feel for is Gann analysis. I never really got into that, I never really could get a handle on it. So that's one area that I stayed away from. But over the years, I probably studied and used just about everything out there. Your career seems to have a diamond shape: you start with nothing and then you learn a lot, only to realize that using a lot of tools is too unwieldy, so you start throwing stuff out, and you narrow it down again. If you talk to most people who have been around for a while, who are trading or analyzing, they'll tell you that over the course of time they narrowed it down to a handful of things that they feel strongly about. That's pretty much what I have done.

J: Could you give me some examples of the things that you learned when you first started working as a technical analyst?

JM: One thing I did learn very early was the idea that the technical work is the leading indicator of the fundamental work. I learned that very early on and in a very dramatic fashion. It was in the early 1970's, when, as I mentioned, the commodity markets just started going up, in a way that had not been seen in 40-50 years. I was writing all these very, very bullish reports, and there must have been 40 or 50 fundamental analysts who said, 'this is crazy, commodities can't go that high.' I remember being very severely criticized for being irresponsible. And, as it turns out, the commodities went through the roof. So I learned early on that you had to be comfortable being in the minority. If you are right on the market most of the time, you are going to be in the minority, because the majority is usually wrong. Another thing I learned early on is that there is a difference between analyzing something and making research recommendations on one side, and managing money on the other side. Towards the end of the 70's and in the early 80's, I started actually managing money. Trading tactics became a lot more important. It is not just enough to be right on the direction of the market. The timing has to be especially good, and that timing is almost completely technical.

J: Did you see any contradictions between the classical literature and your own experience?

JM: I did not see any contradictions. In fact, I was pleasantly surprised that it worked as well as it did.

J: Which mistake did you learn the most from?

JM: I've made two big mistakes over the years in terms of philosophy. The one was seeing something on a chart and not pursuing it, because everybody disagreed with it. You have to believe what you see even when people disagree with it. There were occasions where I missed a very good trade because I decided that I would be too criticized if I followed

it. So I learned over the years not to do that. My other big mistake is related to the old trading axiom 'let your profits run and cut your losses short' and to the discipline that this axiom implies. What I've learned is that you have got to be very, very disciplined. The biggest mistake you can make if you are in the stock market, commodity market, or any other market, you get out too soon. This one had been one of my flaws over the years – if I was in really big move, I tended to get out a little too soon. You have got to have the discipline to stay in, and you shouldn't sell something unless there is a really good reason to sell it.

5.11.2 Personal style

J: Could you describe your own distinct style of technical analysis?

JM: Over the years it's become a little bit more classical, in a sense that I rely on classical chart patterns, trendlines, moving averages, oscillators, things like that. I guess what I've become best known for over the years is intermarket analysis. I wrote a book on this back in 1990 called *Intermarket Technical Analysis*, and I just did another one this year (2004). This was an outgrowth of my having worked in the futures markets, where we were trading bonds, stocks, commodities, the dollar, and where I started to notice all kinds of correlations. The whole idea of the book was that all these markets are related. For example, if you are trading the stock market, you also have to follow bonds, since what happens in the bond market has an impact on stocks. And bonds are very much affected by commodity prices. For example, when commodities turn up, that's an early sign of inflation. Commodities turning up pushes interest rates higher, and, in time, that becomes bearish for stocks. Now what pushes commodity prices higher is the falling dollar. So my point is that you can't really look at any one of these markets all by themselves – you have to understand the impact they are having on one another. Also, global markets are very, very important. Then, in the stock market, there are sector rotations – depending on where you are in the business cycle, you need to understand which sectors of the stock market you should be emphasizing. That comes out of the whole body of intermarket analysis. So if I am known for anything distinctive, that would probably be it.

J: Could you describe your approach in your own practice of technical analysis?

JM: It's not complicated. I look at all the markets. The stock market is the most important. I do a top-down approach, and I am very sector oriented in the stock market. First of all, I try to determine if the stock market is a good place to be at any given time. But most of my work is a little bit beneath the surface. I do a lot of sector work and the industry group work. My view is that when the stock market is going up or down, and even when the stock market going sideways and doing nothing, there is always something going up and there is always something going down. I have found that the sector work is actually one of the best places to use technical analysis, because there is so much going on beneath the surface in the stock market. We have about 10 major market sectors and about 90 industry groups,

and some of them are always going up and down. Also, since the turns come fairly quickly, they can be spotted very easily on charts. So, mine is a more active trading approach. I use relative strength analysis, for example. We divide all the various sectors by, say, the S&P500. We only trade those sectors that are outperforming the market, and we try to capture them as early as possible. We try to avoid the sectors that are underperforming. I think this is one of the best uses of technical analysis.

J: How much of what you learn from others do you directly apply in your own analysis?

JM: It's hard to tell. I guess over the years we all learn from each other. Martin Pring, for example, has written several books – I've read them, and I've learned a lot from Martin. I've read most of what's been written over the years. I've gone to MTA meetings and conferences and listened to people speak. So we all learn from each other, but, ultimately, everybody applies these things differently. If I get up and talk about an intermarket relationship, someone might like the idea, but they may apply it differently. It's how you put these things together that matters. We are all artists in a way – even though there are rules that we follow, everyone does it just a little bit differently. I've learned a lot from other people, but we all develop our own individual style. The actual technical tools you have to adopt from others, because you get them from reading and listening to other people, and you develop a few things yourself, obviously.

J: How do you learn what works for you and what does not, without making big losses?

JM: Well, big losses we've always tried to avoid. We make a lot of mistakes – we probe the market if we think it's going up – but one of the very valuable aspects of technical work, which I think sometimes gets overlooked, is that it tells us very quickly when we've made a mistake. For example, if a stock breaks out though a resistance level, that's very bullish. But if it slips back below the breakout point, then we know something has gone wrong – knowing that is a big advantage. So when we are wrong, we generally try to take very small losses. In fact, you can be wrong 50 percent of the time, but if your losses are small, you can still do OK. I've taken a few big losses over the years. It's kind of a trial and error thing, and, as you go along, hopefully you learn from your mistakes and you just get better.

J: Is your analysis more effective when you are working by yourself or when you are working with others?

JM: Definitely by myself. I work in New Jersey now, and I have an office all by myself. I don't keep the television on any more. Once in a while I may turn on CNBC or Bloomberg, just to hear a little bit of what's going on, just in case I am missing something. But, ultimately, I think you are better off being away in a quiet spot by yourself.

J: So, you think that, in general, technical analysis is done better individually?

JM: Yes. It's important not to be affected by the noise, by all the yelling, and by everybody else's opinion. I like to know what certain people are thinking. Once in while, if I do have the TV on and someone comes on whom I respect, I certainly want to hear what they have to say, not so much because I want their opinion, (though that's also nice to know), but I am interested more in what they are looking at. Maybe they are looking at something that I haven't thought of. But, ultimately, I think you are better off working by yourself. I think anyone is better off working by themselves, though I realize some people may thrive working in a noisy environment, such as the trading room.

J: In what kind of market conditions do you make most mistakes?

JM: Probably in a trading range type market. When the market is trending, it's hard to make too many mistakes, because the market kind of bails you out. When the market is going down – like, for example, from 2000 to 2003, when the market was in a clear-cut downtrend – our technical work keeps us out of trouble. The really difficult situation – and the first half of this year has been an example – is when market just trades sideways. It's very frustrating. You get frustrated and impatient, and your clients get impatient. I manage money now, and my clients say, 'Why aren't we making any money?' Well, the market is not going anywhere. So sometimes you start to force things, and you get a little too aggressive when you really shouldn't. Or, if you do get a quick profit, you might take it a little too soon. In other words, you are under pressure and you are trying to force things a little bit. The hardest time to trade is the trading range.

J: How much of what you do are you willing to share with others?

JM: I am willing to share with the technical community. I don't talk to a lot of people during the day. If someone calls me up and I have time to talk to them, I'll ask them what they think and I'll share my ideas – I have no problem with that. I'll also share my ideas if I am in an MTA meeting. But on a day-to-day basis, I generally don't talk to too many people, but that has nothing to with not wanting to share, I just don't talk to a lot of people during the day.

J: Do you share all your ideas, inventions, and the ways you interpret things? Is it open to public?

JM: Yes, it is open. I very often give speeches at the MTA meetings, though I don't explain everything I am doing on a day-to-day basis. That's one of the nice things about the MTA – it's very open, and we all share ideas.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

JM: I think there is a skill level, just like in the medical field. Everybody goes to medical school and everybody learns about the same human body and about how it works, and yet you have good doctors and bad doctors. That's true in any field. Some people just have a higher level of skill than somebody else. That's the only way I can explain this – some people develop more skill than other people. There is a certain artistic, creative element to it as well. Also, over time, you develop an intuitive element. It's a skill.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

JM: This is an ongoing problem with our technical work. If you get too long-term oriented, then you give up too much in the beginning and in the end: you get in too late and you get out too early. If you become too short-term oriented, then you do run the risk of getting caught up in noise. You can't avoid it totally, but, as I always tell people, you can try to minimize it by looking at things from both the short-term and the long-term perspectives. For example, even if you are looking at a short-term chart, you should also always look at the long-term chart as well. That helps put things in perspective. This is where the intermarket work comes in. I am looking at the stock market, but I am also looking at what's happening in the dollar or in the bond market, and sometimes that helps clarify things. So I am looking at a lot of different things. All I can say is that you can't totally avoid it – it's going to happen on occasion – but if you look at the weight of the evidence, you can minimize it. You can't eliminate it, but you can minimize it.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

JM: That's a hard question. Some of the intermarket work that I do is sometimes considered as having a little bit of fundamental analysis in it. For example, I pay a lot of attention to the direction of interest rates, as it has an impact on the stock market. I also analyze currency trends, trend of commodities, and inflation. These are sometimes considered fundamental factors. I don't necessarily agree with that, but I've been accused very often of sounding almost like an economist when I am on television, which I am really not. I think the trend in the industry now is to blend the two. I've often said to fundamental analysts that the price action is the leading indicator of the fundamentals. If you are not following price action you are really not doing fundamental analysis. I often hear people say that a particular analyst may be very bullish on a certain stock, despite the fact that charts look very bad. 'So,' they say, 'the technicals may be bad, but the fundamentals are good.' But I say, 'wait a second, that can't be!' Technicals and fundamentals are not divorced from each other. If the technicals are bad, then the fundamentals have to be bad. So I think there is a blending of the two. Most of the audiences I talk to are not technical people; they are fundamental analysts. And I tell them, 'I am not suggesting that you give up what you do,

I am just suggesting that you should be looking at the technicals to improve your timing.' There is a big problem with fundamental analysts, and we saw this just a few years ago when the stock market went into a very big decline. If they issue a bullish forecast on a particular industry, like technology, what do they do if it starts to collapse? The fundamentals haven't changed, so they still sit there and issue buy recommendations all the way down. They have no stop-loss, whereas in the technical work, if I issue a bullish forecast and it starts to break down, I say, 'wait a second, something is wrong here,' and I get out.

I think there are two ways to combine the two. First of all, if you are a fundamental person and you are following a particular industry or stock market or whatever, you should first form your fundamental judgment as to whether you like something or not, and then look at the chart to see it if it's in an uptrend or in a downtrend. If it's in a downtrend, you just may want to wait a little while – just use it to help you with the timing a little bit. The second way of combining the two is something I experienced many times when I worked at Merrill Lynch back in the 70's. When you see something happening to the market on a chart – it suddenly breaks out on the upside or it suddenly breaks down – you go running to the fundamental analysts' office and say, 'Something is happening in your market' and they say, 'No, no, no. There is nothing happening. There are no fundamental news.' Then, three months later, they find that something has happened. So, technical analysis becomes an alert thing. If you are a fundamental analyst and you see something unusual – maybe a lot of volume coming into a particular security – it should alert you that something is obviously changing here. So, there are various ways to blend the tools. I am not a firm believer in just using technical analysis all by itself in the classical sense – that's why in the work that I do, in my intermarket analysis, I look at interest rates, inflation, and things like that. My work is considered by some people to have fundamental elements in it. I do a lot of analysis on the business cycle. So in my work I do blend technical with some fundamental and some economic analyses. That works best for me.

J: How much of your technical analysis is done on an intuitive and subconscious level?

JM: That's a good question. I think as you get older, more and more of it. You try not to do that. You try to be disciplined, and you try to follow the rules. It's not good to trade just from hunches. But there are times when I look at all the evidence and I decide to make a move – to get into or get out of something before it happens – and if someone were to say to me, 'Why exactly did you make that decision?', I would have to say, 'I am not quite sure – it just felt right or it didn't feel right.' I don't want to overemphasize that, but I do think that over time, your memory banks remember certain things, and this is where the skill level comes in. Over time you learn to spot and anticipate certain situations. So, whether we want it or not, the subconscious and the intuitive side are always going to creep into it.

J: Is it possible to say what percentage of your analysis is done on an intuitive level?

JM: I hope it's not too much. It's very hard to say. I hope it's a small amount. It's just

that you look at a lot of things – it all goes into your head, and then something comes out. It's hard to tell how much of it is based on skill – on the fact that you've done this a million times before – and how much of it is intuition. It's hard to put a number on it.

5.11.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

JM: As far as the least reliable indicators are concerned, it's hard to say what they are, because there are so many indicators out there. There are many indicators that I've worked with over the years. A lot of what I use is just simple charts. Because I look at so many different things – I look at the stock market, I look at all the sectors and industry groups – I don't have time to analyze each one minutely. So I am always looking for stocks and industry groups – and I have screening techniques – to see what's outperforming and what's underperforming the market. I look at a lot of charts in many instances using trendlines, moving averages, relative strength analysis, volume – very simple classical stuff. I just try to look for what's going up, and avoid what's going down. Looking at too many indicators is a mistake that's often made. I notice this particularly among younger analysts that I've worked with. I've given a lot of seminars, and I've taught a lot of classes; I still talk to some of the students, and they just look at too many indicators. They look at some very fancy, esoteric indicators, but I am not sure they understand what they mean. As far as other indicators are concerned, one of my favorites is called MACD (moving average convergence divergence). I also use things like RSI and stochastics. There are maybe 20 different indicators out there that come under the category of what we call oscillators, and they duplicate each other. So I pretty much stick to RSI and stochastics. We have two classes of indicators: We have moving averages which are good in a trending market, and then we have oscillators which are good in a sideways market. What I like about MACD, which was developed by Gerald Appel, is that it combines both: it's a moving average system, which gives us good signals, but it also tells us when the market has gone too far up or too far down. There is a lot in it. If I had to choose just one indicator, that would probably be the one.

J: How do you test patterns or indicators before you start using them in real trading? Do you ever ask for other people's opinion when you are making such decisions?

JM: That's a good question. I guess it's trial and error. I've never gone back and done a historical study. It's very hard to do quantitative analysis of chart patterns, because they are somewhat subjective. You can teach a computer to do all kinds of wonderful things. For example, if you are using a dual moving average system, a computer can tell you when the one goes over the other – that's a buy signal. A computer is very good at that. But chart patters are somewhat subjective – I know some people who have tried to objectify them, and we've done a little work in that area as well. It's very hard to teach a computer to read a chart pattern. It's very hard to quantify charts patterns over the years. But, having worked

for almost over 35 years now, I would say that there are some patterns that I am comfortable with. I've thrown out most of them; there are only a few that I really pay attention to – things like head and shoulders, double tops and bottoms, triangles. Those are the things that I see quite often, and I have quite a lot of confidence in them. I don't pay too much attention to most of the others.

J: What have you thrown out?

JM: Just about everything else – things like diamonds, flags, pennants (which are very short-term patterns), rounding tops and bottoms. They are just not that common. I am not saying they don't work – it just seems to me that they are not that common.

J: How about broadening tops and bottoms? Are they common?

JM: No. They are very, very uncommon.

J: Rectangle tops and bottoms?

JM: Yes, rectangles I would probably classify as good, reliable patterns. With the company called MetaStock, we've developed a chart pattern recognition package, which has actually worked quite well, but we've limited ourselves just to head and shoulders, triple tops, double tops, and triangles. That's all we did. We decided that those were the only ones that were relevant.

J: Did you do inverse head and shoulders, and triple, double, and triangle bottoms?

JM: Oh, yes, we did both tops and bottoms.

J: How do you test some of the more readily quantifiable indicators?

JM: Again, it's largely by trial and error. As I've said, I've thrown out most of the indicators, because they duplicate each other. One of the reasons it's hard to test indicators is that the indicators are really very secondary – there are so many other factors to consider. If you are in a trending environment, for example, many of the indicators will work beautifully. Let's take an indicator such as stochastics. I've seen people writing articles, proving that stochastics doesn't work. The problem is these articles are often written by analysts who don't know how to use the indicators they are writing about. Stochastics is just an overbought-oversold oscillator: when the number goes above 80, you might want to sell, when it goes under 20, you might want to buy. But that's a very crude description – nobody really uses it like that. What you do instead is that if you are in an uptrend or a bull market, you wait until it goes under 20 and then you buy it. You are not really worried about the selling part, because you are in an uptrend. If you are in a downtrend, it's just the opposite.

You are looking to sell the rallies, and you are looking to buy the dips. I've seen people look at a major downtrend and say that someone who would have bought it every time it went under 20, wouldn't have made money. And I say, 'yes, but no one uses it that way – if they do, then they are a very bad analyst.' That's the problem with testing indicators. Another example is that you have to understand that the moving average indicator works very well in a trending environment, but it does not work well in a trading range environment, so you have to know which environment you are in. Now, we have indicators that tell us whether we are in a trending or in a trading environment. A lot of times indicators depend on other indicators, so you have to know which indicators depend on which other ones. Furthermore, there are times to be aggressive, and there are times to be cautious. There are times to buy breakouts, and there are times not to buy breakouts. So, everything fits together.

J: My previous question was: How do you test patterns or indicators before you start using them in real trading? To follow up on that, may I ask you if you ever ask for other people's opinion when you are making such decisions?

JM: Oh yes. There are many magazines out there, such as, for example, the *Market Technicians Journal* which is published 3 or 4 times a year. There are lots of articles in there where people go back and test these indicators. Then there is magazine called *Technical Analysis of Stocks and Commodities*, which has been published for 20 years now out in Seattle, Washington. Same thing there – they are always writing articles on the testing of the indicators, on the new indicators, on the ways to improve old indicators. So there is a lot of research out there, and there is a lot to be read. But just because you read an article on something, doesn't mean you are going to go out and use it necessarily. That's why over the years I've gravitated towards some of the more classical indicators that I understand and that make sense to me. If I don't understand the formula for something, I am certainly not going to use it. So what I use are fairly simple things, and I have a lot of confidence in them.

J: Do you have confidence in other people's research and back testing?

JM: There are certain people in our industry that I have a lot of respect for. I always read what they write very carefully, because I know that they do very thoughtful, very good research, and they also have experience. So, yes, there are certain people in our organization that I always pay a lot of attention to.

J: Would you adopt a new indicator purely based on other people's research and back-testing?

JM: It's not so much adopting a new indicator, as much as another way of looking at something. More than anything, it's the nuances that I am looking for in other people's work. Someone might write about a seasonal pattern, and I might find it interesting and decide to keep it in mind. It's more about the nuances and the subtleties, as opposed to the

adoption of a new indicator.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

JM: Yes. This is another thing about chart patterns that a lot of times people don't understand. For example, let's take a head and shoulder bottom (or an inverse head and shoulders, as it's called). You may look at the chart of a certain stock, and you may see a perfect inverse head and shoulders bottom. Everything may look absolutely perfect, but it doesn't work. People say to me, 'It was perfect, why didn't it work?' and I ask them if they looked at the industry group it was in. For example, it has been estimated that as much as half of the stock's direction is determined by the industry. If you are looking at a retail stock, for example, and it's forming a bottom, but the retail group is in a downtrend, then the odds are very much against you. What about the stock market? If the stock market is going up, and you find a good head and shoulders pattern, it will probably work pretty well, especially if it's in a good sector. But if you see the same head and shoulders bottom when the market is in a bear market, it's just not going to work. People will say: 'We have got a breakout in a certain stock, so I bought the stock, but it went down! What happened?' And I'll say, 'Did you notice that the market went down by 500 points that day?' I mean, you have to take into consideration the sector that something is in, and you have to take into consideration whether the stock market is going up or down or not. That to me is the main thing about patterns – they will work in the right environment and you just have to make sure that you are in the right environment. That's where the skill and experience come in. The odds of a buy signal working are much better if you are in a bull market, as opposed to the bear market.

J: Could you give me an example of a pattern or an indicator that is particularly sensitive to such changes in the environment?

JM: It's going to happen to any pattern. The pattern is only as good as the industry group that it's in and the stock market. This is maybe a little bit off the subject, but up until 2000, we had a lot of people who were day-trading. They were making a fortune. I remember giving a lot of seminars to these people. Then we went into a big downtrend in stocks, and they all went broke. I remember a lot of them saying to me, 'Mr. Murphy, these signals did not work any more.' And I said, 'Of course they didn't work – all you are doing is buying! The short-term buy signals that you are getting are legitimate if the market is going up. If the market is going down, those little buy signals don't work. You have got to look at the environment!' So it's not so much the signal, it's the environment.

J: Is the number of indicators you follow greater when your trades are larger?

JM: As I do a lot of sector work, my job is more and more just trying to determine if a given sector is moving up or down, and if it's outperforming the market. To do that I use a

lot of relative strength analysis, I look at the volume, etc. It's not so much looking at a lot of different indicators; it's just having a handful of indicators that make sense. For example, we use moving averages, and we won't buy anything that's under its 200-day moving average, because that means we are in a bear market. That's just a very simple rule. If we are trading a certain sector, the 50-day moving average is very important for short and intermediate term. We generally don't like to buy anything if it's below its 50-day moving average. The moving average rules act like filtering devices. If we are looking for buying opportunities and we want to put money into the market, for example, we follow such a simple rule: We simply find out which sectors are trading above their 50-day moving averages, or which ones are moving up through their 50-day moving averages, because those are the ones that are leading the market higher, and that's what we concentrate on. If a group goes under its 50-day moving average, we may sell that group. It's a very simple indicator, but it works very well. So the moral of this is, whereas many of the younger people in our business seem to gravitate toward the very fancy indicators – exponentially smoothed averages and all this – the old-timers among us are using some of the simpler ones. I have come to believe over the years that the simpler indicators actually work better. They are simple, they are easily understood, and, surprisingly enough, not as many people look at them. Taking a Nasdaq market as an example, we did a study going back 30-40 years and comparing the buy and hold strategy to a strategy of buying it whenever it's selling above its 50-day moving average – the results were absolutely staggering. Just a simple little thing like that would have kept you out of the most of the bear market of 2000. The 200-day moving average would be basically the same thing: you hold the market, unless it's below its 200-day moving average. An economist would laugh at that, but it keeps you out of every single bear market. It's that simple. It's a discipline.

J: So, the amount of money involved never determines the number of indicators you follow?

JM: No, absolutely not.

5.11.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

JM: There is a lot more written on the subject, as we've already talked about. Many more indicators have been developed over the years. I think it's more widely used than it was then. From my standpoint, one of the major changes has been in the intermarket area. When I first wrote my book 15 years ago on the intermarket work, most stock market analysts really did not pay much attention to the price of gold or the price of oil. In fact, that's a good example. I wrote about this 15 years ago: whenever the price of oil is moving up and it moves close to 40 dollars a barrel, the stock market always goes down. That has happened every time if you go back 30 years. So, the oil becomes a tremendous factor. We

saw that this year. The price of oil in the third quarter of last year into the spring went up near 40 dollars a barrel, and the stock market went into a big correction. As soon as oil started to come down, the stock market started to rally. Every recession that we had has been caused by a rise in oil prices. Fifteen years ago nobody paid any attention to that, but now you turn on CNBC, and they talk about the impact of the dollar on interest rates, and I see technical analysts talking about these things. I think technical work has broadened in a sense that we look at global markets, commodity prices, oil, etc. I'd like to see technical community get away from the use of a lot of technical jargon, words such as head and shoulders. I find that that's a very hard sell when you talking to a non-technical audience. It's hard to convince them they should buy something because of the head and shoulders bottom – they laugh at you. But if you could say to them that we see a head and shoulders bottom in the energy group at the same time that the price of oil is going up and, on a relative strength basis, oil and energy stocks are beginning to outperform the rest of the market, then they understand. There may be a head and shoulders bottom in there, but you should talk to them in language that they can understand, and then I think there is a lot more credibility.

J: Where do you see technical analysis going in the future? How do you see it further evolving?

JM: I think technical analysis is just really beginning to move forward. For example, I manage a mutual fund now, and we are doing asset allocation. In other words, we are allocating how much goes into stocks, how much into bonds, how much is in cash, how much goes into global markets, and this is all technical. Then we decide which asset class we want to be in. Commodities have done very well in the last couple of years. Within the stock market, we consider sector rotations. That's all technical. I know that the TV and the print media have a very narrow view of what technical work is. I experience this all the time when I get calls from CNN or other TV stations. I used to work at CNBC, so I still get calls from them every once in a while. All they want us to talk about is a trendline or a moving average. If I start talking about inflation and interest rates, they say, 'No, no, no! You are just a technical analyst, and you shouldn't be talking about these things!' So I think technical analysis is really broadening. As I mentioned, we manage a fund based almost purely on technical analysis.

Technical analysis is being recognized as a much broader field. Let's take economic analysis, for example. There was a fellow called Geoffrey Moore, who was the leading business cycle expert in this country. He created the leading economic indicators. He passed away a few years ago, but he worked well into his 80's. He wrote a book called *Leading Economic Indicators' for the 1990's.* He compared commodities, bonds, and stocks, and went back and showed that there is a very predictable chronological order. At the end of economic expansion, for example, bonds always turn down first. That's because of inflation. Then, after a while, stocks turn down, and, a while after that, commodities turn down. At the bottom it's just the opposite. So by studying the three of them, you can tell where you are in the economic cycle. He did it quantitatively – he gave leads, lags, and everything else.

Very often, I write pieces on where the economy is. By knowing where we are in stocks, bonds, and commodities, we are actually doing economic analysis. These markets are leading indicators. The stock market is the leading indicator of the economy. So we are actually moving into economic analysis.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions? Also, do you study the new inventions just to know what others might be doing, or do you also update your own strategies as the field evolves?

JM: Things that I look for are not so much technical indicators, although every once in a while I run across a study that I do find very interesting. I am very prejudiced, but I think one of the most fertile areas for technical work is the intermarket area. I am always very interested in the linkages. For example, emerging markets are very closely tied to commodity prices. From 2002 to the beginning of this year, commodity prices were very strong, and emerging markets were very strong. And earlier this year, commodities turned down, as did emerging markets. That's the kind of thing that gets me excited. Or, when the Fed raises interest rates, I am interested to see what effect does that have on the dollar and on the gold market. I am looking at the markets, I am looking at relationships, and I am trying to understand why one group goes up. For example, when the Fed is about to start raising interest rates, I want to know which market sectors do better in a climate of rising rates. I mean, I can see that on my charts, but I like to know if there is an economic justification for it. There has to be an economic reason for something to happen. We are just doing short-cut fundamental and economic analysis, so I always want to understand if whatever is happening makes sense from an economic standpoint. Relationships between sectors constitute a very fertile area for investigation. And, by the way, determining which sectors are in the lead tells us a lot about the economic cycle. For example, when energy stocks take over market leadership, that's an early sign that the economic cycle is coming to an end. When financial or transportation stocks take over leadership, that's usually a sign that an economic cycle is beginning. So, by studying sector rotations we can also tell where we are in the business cycle. Those are the areas that I find interesting – it's not so much technical indicators, it's more the understanding of economic relationships that concerns me.

J: Are all of these new indicators pretty much useless?

JM: I think it's been done. There is only so much you can do with the numbers. Every now and then I'll run across an interesting idea, but, generally speaking, I don't see a lot of future in new technical indicators. It's all been done. What we have is price and volume data. That's all we have, and there is only so much you can do with that. In that *Technical Analysis of Stocks and Commodities* magazine that I mentioned, I am always reading about new indicators, and they are all very interesting, but I don't think that's where the future is.

J: To what extent has the introduction of the variety of computer software aided the craft?

JM. I think the computer has become very useful in allowing us to look at lot of different things at the same time. Also, one of the great uses of computer is easy implementation of filtering devices. For example, you can program a computer to tell you which stocks are moving above their 50-day moving average. If you have 5000 stocks, you can't look at them all. You can program a computer to alert you, at the end of the day or during the day, if certain things are happening. A computer will rank for me which sectors are the strongest today, and then I'll take it a step further and it will tell me which stocks are the strongest. On my computer I can look at two screens – with two clicks, the computer will show me a chart of the strongest sector of that day, as well as a chart of the strongest stock. Within 20 seconds, I can be looking at the 5 best-performing stocks in the best sector. I think that's the use that has been overlooked. Those are the advantages of the computer – it does all the indictors for us, and it allows us to test things. It also allows me to do a lot of comparison studies and overlay analyses – when something goes up, something else goes down. The downside is that sometimes the computer gives us too much information, and you have to learn how to use it. Some software programs have 80 indicators in them. I don't know what someone can do with that much information. On balance, I obviously think it's been a great invention. If they had it when I was starting out, things would have been a lot easier.

J: To what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

JM: A lot of our stuff is computer generated. We have a trading model that we use in our money management work. I think the real value there is the discipline. You can't possibly see everything that's going on everywhere, but having a printout at the end of the day or in the morning, which ranks various stock market sectors and shows you where strengths and weaknesses are, is useful. We have certain criteria that have to be met in order for us to buy something. I may not totally agree with the decision brought about by these criteria, and I may feel uncomfortable doing it. Or, if something that we have a position in slips below something on a certain ranking level, the computer will tell us to sell some of it, and I may not always agree with it. And I am very often wrong and the system is right. I think the real value of computer generated signals is the discipline factor. I don't happen to believe, however, in following computer system slavishly. I am not a pure system trader, because there is always a little art involved. I never want to deviate too far from the discipline, but I think there are times when you can anticipate something. As I mentioned, most trading systems are trend-following systems, so in the first six months of 2004, they haven't worked well. If you as an analyst can see that we are in a trading range environment, that has to influence you – you can't just sit here and buy and sell, buy and sell, and just lose money all the time. There is a certain element of judgment in there. Even if you follow the signals, you may have to decide how much weight you want to put on them – you

may put just a little bit of weight on some signals, more on others. So I think you have to blend the two – computer generated signals on one hand, and your judgment on the other.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

JM: There is some advantage to keeping charts by hand. I don't do it any more, because I just look at too many different things, but I used to do it for many, many years. There is a certain discipline involved in sitting down at the end of the day, plotting the chart, and looking at it, because while you are looking at it, you are analyzing it. When you are trading or doing technical analysis, you really have to be disciplined. You have to be on top of everything. Very often if you make a mistake, it's because you didn't see something or you just didn't pay attention to it. So the beauty of charting is that it's a discipline, it forces you to look into things. But I just look at so many different things now that unfortunately I can't do my charts by hand. But I do have a routine that I go through every day. There are certain charts on my computer screen: overall charts of the stock market, industry charts, commodities, currencies, etc. There aren't actually that many, maybe 40 or 50 charts that I look at. I make it a point to scan through them at least once a day and usually several times a day, making sure that I look at each one, just in case there is something happening that I might be missing. That's the discipline. That's another advantage of computers – they are set up in such a way that you can use them to screen through things very quickly. We also have screens that alert us if certain things are happening. If I don't do that, I feel totally out of touch with the market. If I come in the morning and I don't go through my routine, I am off all day, I just don't feel right the whole day. So I don't do them by hand, but I do try to look at everything, at least once.

J: Is the main advantage of charting by hand the discipline that it provides? Do you feel that one would obtain more insight if one were to do some of the charts by hand?

JM: I don't know how you could do them by hand any more. I don't know of any such chart service. And, besides, the charts that we are looking at have indicators on them. Every chart that I look at has three or four pre-selected indicators on it that I am looking at, and they are being updated all the time. If I was doing charts by hand, that couldn't happen. So I think there is some value in charting by hand, but it's really not that huge any more.

5.11.5 The innovative process

J: What drives your innovative process?

JM: The desire for profits. Ultimately, we are in the business of being right. In a sense, we are trying to predict the future – well, I don't even know if 'trying to predict the future' is the right way to put it, but I guess we are in a sense – and the challenge is to do it right.

It's like playing golf. If you are a golfer, you go out there and you want to improve your shot and your swing. It's not an ego thing so much, it's the desire to get better and better. We are in the game of making money, and, at the end of the day, you either make money or lose money. As you go along, maybe you learn a few shortcuts here or there, and you pick up a trick or two. You are always driven by your desire to get better.

J: Do you and to what extent collaborate with others during the innovative process?

JM: Very rarely on a daily basis. I may read an article here or there, or, if I am talking to someone, I may ask them their opinion on certain things. I would say that I do most of my work alone. It's very solitary, lonely work.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

JM: Yes, I think that's the process you go through. You start off knowing certain things, and they work well. Then you make mistakes, or you get caught in a bad market, and you say, 'I've got to come up with something better.' So you start adding things over the years, or you start studying different theories, and you find that you may take one little thing from each theory. I'm not a big user of Elliott Wave work, but there are certain aspects of it that I use. There are certain aspects of cycle work that I use. I happen to be a big believer in the use of classical tools – that's why I've gravitated back to them. But, again, there are many different ways of looking at them and putting them all together. For example, a lot of people use daily bar charts, and sometimes the signals work, other times the signals don't work – it's important to look at a weekly bar chart that goes back several years as well. For example, let's consider the MACD indicator. Suppose you are following just a daily chart, which is what most people do, and you get a buy signal on your MACD, and let's say it doesn't work. Now suppose you look at the weekly chart, which shows a much more important trend, and the weekly chart is on a sell signal. So even if you get a buy signal on your daily chart, you have to make sure that there is also a buy signal on your weekly chart. It's not so much the indicators, it's how you put it all together. But, yes, over time you tend to add a lot of stuff, and then gradually you begin to narrow it down again until you wind up with a fairly simple approach. That's the diamond shape I was talking about earlier. I've seen many tests that have been done of all kinds of trading systems over the years, and, consistently, the ones that rank the highest are very, very simple.

J: At this point in your career, would you say that classical technical tools are perfectly sufficient?

JM: I wouldn't say that. Some of the useful technical indicators are still fairly new. I wrote *Technical Analysis of the Futures Markets* in 1987. I wrote about a lot of timing indicators that have been developed in the futures industry – like RSI and stochastics – which

now have become quite popular in the stock market, though they were really developed for futures. So there are always new things coming along. I would say that, generally speaking, my intermarket work is a new approach. When I say that classical tools are sufficient, I mean it in a sense of chart patterns, moving averages, trendlines, and basic charts things, with a few indicators.

J: How soon after you develop a particular technical tool do you make it accessible to public? Also, why do you share your inventions with others, rather than keeping the edge just for yourself?

JM: That's always a tough question. I talk less and less to the public these days. Generally speaking, if I am giving a speech or if I am on television, I may share some ideas, but I don't share everything. Wouldn't you be suspicious if someone found something that worked for him, and then he suddenly broadcasted it? We all have little tricks that we use, our little favorite things that we don't necessarily talk about. My responsibility, since I manage a mutual fund now, is to my clients. My responsibility is to manage money for them and make money for them. It's no longer my responsibility to go on CNBC and tell people how we do it. So I've become a little more selfish. Not that the techniques we use are that complicated, but I don't feel any responsibility to share those ideas.

J: Did you feel that responsibility at some point in your life?

JM: Yes, early on, because I wrote many books. Most of the things I wrote about were things that were commonly known – other people's work – but I showed people how it all fit together. My intermarket analysis was more creative than that in trying to explain to people how different things work. So, in that sense there was sharing, but as far as my day-to-day trading is concerned, I've never felt the need to share. I am always very suspicious of people who go on television and tell people what they are doing or what they are getting ready to do in the market.

J: So, there are tools that you developed but never shared with the rest of the world?

JM: Well, not so much the tools, but how you put it together. How can you share? I am not sure I can explain to you exactly how I do what I do. I look at a lot of things in a very short period of time, and I form an impression. I am not sure I could completely explain to someone how I do it. So it's not so much any indicator, it's just that everyone has their own unique way of putting it all together, and I don't know how you can even explain that to somebody.

J: How often do you use the technical tools – be it indicators, strategies, ideas, or ways of interpreting - that you came up with?

JM: I did not necessarily develop the tools. I've used a lot of the tools that other people developed. I've never developed a technical indicator. I may have pioneered different ways to combine them and do a lot of different stuff with them. The creative stuff that I did was more in the intermarket area. But, whatever I've developed, I use all the time, every single day.

5.11.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money?

JM: How did I feel when I first lost a lot of money? Very stupid and very embarrassed, because I was working in a very public position at the time. This goes way back to the 70's. In one of the first trades I made, I made a recommendation on a particular commodity, and it just fell out of bed for a full week. That could have ended my career, and it almost did. But I would say that one of the things that I have learned over the years is that you are always going to be wrong on occasion. With that in mind, you are always testing the market. You think that a certain market is beginning to turn up, whether it's a stock, a sector, or a commodity, and you put a little bit of money into it. Then, if it starts to get better, you put a little more in – you do it gradually. But if things start to go wrong, you abort it, you get out very, very quickly. That's the way I do it – gradually. One of my rules of thumb is that I am very quick, sometimes too quick, to exit something if I don't like the way it's acting, because I really do believe that over the long run, everybody is going to make money when the market goes up. What you have to do is try not to lose too much of it when you are wrong. I think that's the real key.

J: Has it become easier to lose as you became more experienced?

JM: Only in the sense that you accept it. You have to accept losing as part of trading. You can't be right all the time. You have to accept the fact that there are going to be losses, but you have to be comfortable with yourself and able to say afterwards: 'Yes, I knew what I was doing, I had good reasons for doing this, and I would do it again, but it just didn't work this time. So I just admit it, I made a mistake.' There is an old saying that goes 'the only thing worse than being wrong is staying wrong.' With that in mind, losses are never easy to take, but you accept them as part of trading. What I don't like is, after having made a mistake, realizing that I missed something, that I didn't look at an indicator, that I got emotional, or that I just did something that didn't make any sense. Then I get very mad at myself. But if I can say, 'Given those circumstance, what I did was right,' then I am OK. You are playing percentages. You are saying maybe there is a 70 percent chance that this trade is going to work, maybe there is an 80 percent chance. Whatever it is, you try to stack the odds in your favor, but you know there is always a possibility that it's not going to work out. As long as you are comfortable with the methodology, taking a loss is OK. But it's never easy, you always feel bad when you take a loss.

J: You talked about your first big loss. Did it made you doubt the validity of technical analysis?

JM: At the time it did. I was just starting out in the commodity markets.

J: What made you decide to continue practicing technical analysis?

JM: Well, I stopped trading that particular market. It obviously shook my confidence at that time, but, overall, I had more successes than failures. Fortunately, as I mentioned, I was very lucky in those early days of the 1970's, because it was the beginning of a major bull cycle in commodities. So, most of the trades or recommendations that I made did very well. Over the course of time, the painful memory of that first trade faded.

J: Did you ever seriously consider abandoning technical analysis?

JM: Yes, there have been times. When I lost my first job, and stocks went into a bear market for a long time in the early 70's, I thought that I would be forced to leave it. There was also a time in the middle of my career. Commodity and futures markets – which were my specialty for about 15 or 16 years – are very, very stressful to trade, because you trade very low margin, but there is tremendous leverage, which means you can make and lose tremendous amounts of money. After about 15 years, I got very burned out. I literarily retired, believe it or not. Merrill Lynch actually threw me a retirement party. I was in my late 30's. So I retired, though I did not stay retired long. I just got so burned out that I had to walk away from it for almost a year. Interestingly, I thought about leaving it totally, and I was looking for a new career. Then, someone said to me: 'Well, you don't have to trade. If you have this knowledge, why don't you teach a course?' At one time, I was teaching at four or five different schools. I wasn't making any money, but it was fun. Then one of them said to me, 'Why don't you write a book?' That, in a sense, launched a whole other career for me. Now I am back to trading again. But, yes, there have been times in my career when I've walked away from it. We all have to find what we are comfortable with. I didn't think about it at the time, but it later became obvious to me that I didn't really have the right temperament to trade commodities, even though I did it fairly successfully. Technical analysis is a very broad field, and you have to find that area that you are really comfortable with and that fits your personality. Interestingly, now I am back to trading again, but it's a very different type of thing. I actually find that I enjoy it quite a bit. I am not trading commodities any more!

J: So you considered abandoning technical analysis because of the pressure. But at no point in your career did you actually lose confidence in the technical approach?

JM: No. It was more the pressure of being a trader. Sitting at a trading desk is really a

young person's thing. There comes a day when you just can't do it any more. I don't know what that day is, but it came one day for me and I just got up, put on my coat, walked out of the door, and never came back. I said, 'I'm done.' You just know it. They said, 'Where is he going?' I never came back. That's how it happened.

J: How is the way you apply technical analysis different when you are more cautious compared to when you are less cautious?

JM: We have a decision model that helps us determine when we are to be more or less cautious. When the monetary data, the breadth data, the price data, etc. are favorable, our decision model gives us green light. In those instances, I am more aggressive. When the market is kind of choppy, then you have to be a lot more careful. You might put in a lot less money. Even if you do take position, you do so a lot more cautiously.

J: To what extent do your emotions interfere with your craft?

JM: We all get emotional. I do it, though I try not to. Sometimes, you are watching CNBC or you are watching your computer screen, and something happens. There is a lot of noise, markets are jumping, and you start feeling like you don't own enough of it. Or, if the market suddenly drops sharply, you start feeling like you own too much of it. Even when your system is telling you not to do anything, it's very tempting to say sometimes, 'Well, I am going to sell some here, or I am going to buy some here.' One of the rules that I've learned over the years is that you are better off not making decisions during the trading day. That may sound crazy, but it's true. We determine beforehand, usually in the morning, very often before the market opens, what we want to do that day. If we decide to take a certain position if something happens during the day, we may wait for that something to happen. We know exactly what we are looking for so that if the market suddenly starts to do something unusual, we don't just jump around wondering what to do. We try to follow the rules very, very closely. Whenever I make decisions during the day based on sudden market moves, I am usually making mistakes. Sometimes it's better to just turn the machine off. Sometimes it's better just not to look at it. Once your positions are put in, sometimes you are better not to watch the market.

J: Do you do that?

JM: Lots of times, yes.

J: How has your ability to separate emotions from technical analysis changed since you first started?

JM: It has gotten much better. In the old days, I must admit, the markets I was trading – the commodity markets – were a lot more volatile. Now the way we trade is much more

disciplined. I am also part of the team, so I don't have a total say in everything we do. But we have parameters that tell us how much money we should have in the market at any given point. I have a little bit of leverage there – I may anticipate, I may go a little bit above or a little bit below what the system tells us to do, but I don't deviate too far from it. So the system kind of keeps me honest, and it keeps me from getting too emotional. You are better off being disciplined, and, once you decide what you want to do, it's better to give the instructions to somebody else, as opposed to executing them yourself. For example, if you decide in the morning that you are going to buy such and such a position if such and such happens, write down the order and the instructions and let somebody else handle it, because when the time comes, you might change your mind. Let somebody else implement the strategies, so you are kind of removed from them a little bit. Then there is no need for you to watch the market.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

JM: I think it's a learned thing. I am certainly no expert on it. As you trade, as you mature, and as you get older, you learn to do that, because you see how well it works over time. You see that the discipline is the right way to go. I think it's just something that comes with experience. Maybe it comes with old age. Besides, not only are your trading results better if you are disciplined, it's also much less of a strain. If I am following a system, I may be using a little judgment here or there, but I know there is a backbone, there is a system there – that takes a lot of the burden off of me, so I don't get a heart attack every time the market goes down. And, you know, as you get older, you don't want to live and die by the stock market every day. It becomes more of a business as opposed to a personal thing.

J: In the beginning it was a personal thing?

JM: I think in the beginning it was, because you are trying to learn your craft and you are trying to prove yourself, so sometimes you take chances. As you get older, it's not so much an ego thing, it's not a personal thing. You just go about your business and, hopefully, you beat the market. My attitude is that if you have your money in the right places at the right time, and if you follow the rules, you should be OK.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[18]*." To what extent is this statement true in your case?*

JM: Nothing is ever 100 percent. There is always gray matter. In every decision you are trying to make money-wise, nothing is 100 percent bullish and nothing is 100 percent bearish

[18]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

– there are always shades of gray in there. So you are playing percentages, and there is no 100 percent anywhere. Sometimes it comes down to a feeling. If I have a choice between two things that are more or less equally weighted, sometimes it comes down to a feeling. I just don't feel right about one of them, and I feel right about the other.

J: Do you feel the mini-battle of greed and fear going on within you even when you are deciding ahead of time what to do?

JM: Yes, there is always a little bit of that. There are times where I'll do something and then, five minutes after I've done it, I'll say, 'I am not sure I should have done that.' Then I'll wonder about it, I'll go back and rethink it, but it's already done. So there is always a little bit of that, but over time that becomes less and less prominent. If you have a set of rules and those rules have served you well over time, and if they make sense, you know you are going to be right more often than you are going to be wrong. I always have the philosophy that if I am making a mistake, I have very clear rules that tell me to get out, so it's not like it's going to haunt me for the rest of my life. If I am wrong, I just take a loss, and step aside. So that battle is always there, but it gets a little lesser as you get older.

5.11.7 The role of creativity

J: What role does creativity play in technical analysis?

JM: This goes back to what I said before – technical analysis is a surprisingly broad field. When I wrote my first book on technical analysis, I actually started out with the idea that I was writing a short book over the summer – it turned out to be almost 600 pages, and I still didn't include everything. I was astounded. First of all, I didn't think there was enough material to fill a book. Then, when I started writing down everything I was doing, I suddenly realized how much we actually do. There are so many aspects to technical analysis, and I think there is a creative element to it. If you talk to three or four different technical analysts, each one will have a different way of doing it. So I think there is certain creativity to it. It's just like with doctors – some doctors can diagnose an illness better than others. A good doctor connects the dots a little better. We are always connecting dots, and I think there is a creative element in how you put everything together. You may have two things – one thing may be giving you a buy signal and the other may be giving you a sell signal – and you have to decide how much weight to give to each of them. You may decide to give more weight to this one, because of something you see over here. So I think there is certain creativity to it.

J: Can this creativity be learned?

JM: No. I don't think you can teach that to somebody. When I used to teach classes to students, I would first teach them the rules, and then I would give them examples of trades. We usually looked at live markets. Every once in a while we would come across an example

where everything looked good, and I would say, 'Yes, but I sold it today.' Students would ask me why, but I couldn't totally explain it. Something just didn't look right to me. All you can teach someone is the rules, and you can show them how best to apply the rules. You can't teach someone how to paint. You can teach someone how to color and draw certain things, but a teacher can't make somebody a great painter.

J: So there such a thing as "talent for technical analysis"?

JM: Well, I think that's true for anything. You can look at any field – whether it's fundamental analysis, economic analysis, technical analysis – there are always going to be some people who are better than others, even though we are dealing with the same information. So, obviously, there is a talent there and there is creativity there.

J: Could you define this talent for technical analysis?

JM: I can't define it other than by 'some people are just better than others.' Some people apply the tools better. It may be due to a better understanding, better grasp, better intuition, or better temperament, some people being conservative, others more aggressive – I am not sure what the mix is. How do you define talent? I don't know.

J: Do people who are drawn to technical analysis tend to have their analytical side or their creative side more developed?

JM: I've often thought that an economist is an example of someone who has no creativity whatsoever. We follow markets. I often get in debates with economists because I talk a lot about the economy. We are going through a phase now – here we are in June 2004 – where the Fed is about to start raising interest rates. For months, in the beginning of the year, the economists were saying that there was no sign of inflation anywhere, because all the old indicators that they were using showed no inflation. But all the indicators that we looked at – like the fall in dollar or the rise in commodity prices – suggested that inflation was becoming a problem. So, we look into the future, we see things, we put our neck on the line, we predict. Economists, it seems to me, never predict – they are always looking at old numbers, such as the CPI, the PPI, etc. It's not that I am against economists – it's just that, due to the nature of their craft, they are always stuck in a box, they are always looking backwards. They don't seem to be able to project anything into the future. As a group, I find them incredibly uncreative; maybe that's the kind of mind that's attracted to economic analysis. Technical analysis – and only a small minority of people in our business are technical analysts who devote their life to it – attracts a certain mindset: someone who is unconventional, willing to take chances, creative thinker, maverick maybe just a little bit, sort of out there in the left field, a little crazy. Those are the kind of people who are attracted to technical analysis. Another common trait would be their affinity for numbers and charts. So I think it does attract a certain type of people, the risk-taker type. On the other hand, a

lot of security analysts or economists strike me as being non-risk-takers. They always play it safe. They always have consensus views. They never put their neck on the line too much. They predict the past instead of the future. Technical analysts are more willing to think outside the box.

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

JM: I guess anything can be overcome to a point. Any field that you go into, you have to have a feel or a flare for it. That's the goal in life. Everyone has a talent, everyone is a genius at something. Everyone has a talent for something, and our challenge in life is to find that talent. Among those of us who became drawn to technical analysis, most of us did it by accident. Very few of us started out saying 'I want to be a technical analyst' if you asked us in college. I didn't even know what a technical analyst was. None of us wrote in our college yearbook, 'I want to be a technical analyst' – we kind of fell into it. My feeling is that if you don't have the personality type or whatever it is that attracts you to something, you are better off looking somewhere else. I know a lot of people, I try to teach them technical analysis, and they just don't get it. They say, 'This is garbage. I don't get it.' I say, 'Fine, then do something else.' You know when you are drawn to something, because you enjoy it. The best way to tell if you have a talent for something is to ask yourself if you enjoy it. I actually enjoy doing this.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

JM: I hope not, at least not while I am still around! It's very interesting, over the years I've been asked on several occasions to participate in programming everything I knew into a computer. I finally said: 'Wait a second! Why am I doing this?' I mean, if we can ever succeed, I become obsolete! So I think a lot of it can be done, a lot of it can be mechanized and put into a computer. I have a partner who was a fighter pilot. He was a top gun, actually, at one time. We talked about this many times, and he said that a modern fighter jet, or any plane for that matter, can almost fly itself. A modern airplane can almost fly itself – you can push a button, put it on automatic, and go to sleep. But, as he said, you have got to have a pilot sitting there, just in case something goes wrong. Someone has got to know when to press the buttons and when to do this and that. I sort of feel the same way about technical analysis – a lot of this can be mechanized and a lot of it is. But I am not sure that it will ever totally replace a human being. I hope not, anyway.

J: What about the human being cannot be replaced?

JM: The creative side. Take a chart pattern, for example. I mentioned that we developed a chart pattern recognition package, which recognizes double tops, triple tops, and all that kind of stuff. When we sat down to teach the computer how to read chart patterns, I was

astounded. Something that you can look at and see so easily – I can describe it to you and I can show it to you, and you would say, 'Yes, I see that' – can be so hard to program. I was working with some very good programmers, and they had an extremely difficult time writing out the code. So there are certain things that human eye can see that computer can't see. Also, the ability to put things together and the ability to weigh things cannot be replaced. A computer may be better than a bad analyst. Anything would be better than a bad analyst! I like to think that there are some good analysts out there that are better than computers, though I am not sure I would ever want to have a contest with a computer. But I will say this about a computer. Back in the days when I was trading futures markets a lot more actively, I traded more intuitively, more based on my own style, but I worked with traders who just traded blindly off of a system. I would say that on any given day or any given week I could beat them, but over the long run I think they would beat me for very simple reasons: a computer doesn't get tired, it doesn't take a vacation, it doesn't get discouraged. If I make five losing trades in a row, then when the sixth time around I get another buy signal, I can't act because my confidence is shattered. I am gun shy at this point. I am afraid to act, so maybe I pass up a profitable trade. A computer could have 18 losses in a row, and it wouldn't care. Come the 19th one, it's just as confident as it was before. So, in the long run, I think a computer can beat a human. But you have to survive to get there. You have got to survive the short term to get to the long term. If you lose all your money in the short term, you'll never get to the long term. Even so, I don't think a computer will ever totally replace a human being.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

JM: I think there is some art to it – skill would be a better word. This is true in everything. Have you ever gone to two doctors? Why do we get a second opinion? You never get a second opinion if the first one is good. Why is it that if a doctor gives you bad news on something, you go and get a second opinion? Another doctor looks at the exact same X-rays, the exact same MRI, and he says, 'No, you don't have that problem.' This is often the case. In the technical world, there are so many different things we are looking at, and things can be seen in different ways. I wouldn't say we deviate from each other too much, but if you turn on the TV on any given day, you may see 2 or 3 technical analysts whose views may differ on certain things. So, there is a body of rules, otherwise we have nothing, but there is a lot of subjectivity involved in how you apply and interpret those rules. I like to think of it more as a skill rather than an art. Again, some people are better than others. There is always room for disagreement, but that's true with anything.

J: What percentage is art and what percentage is science?

JM: I would think it's more science than art. If I had to hazard guess, I would say it's

maybe 75 percent science and 25 percent art. If you have more art than science, then you don't have anything. I am just guessing at the numbers. You have to have a lot more science than art. Twenty-five percent art or skill sounds pretty fair to me.

5.11.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

JM: I've heard people say that certain traders are lucky. I've often said, 'I'd rather be lucky than smart.' I think that's true. After years of working and competing with fundamental analysts, I can honestly say I think I've been right more often than I've been wrong, and they've been wrong more often than they've been right. But what I am often told is: 'You were lucky. If there hadn't been a war, this wouldn't have happened, or if there hadn't been a recession, this wouldn't have happened.' One way they sometimes put it is: 'You were right, but for the wrong reason.' I say to them, 'But you were wrong for the right reason – I'd rather have it my way.' I think you make your luck. Maybe some people are lucky, I don't know. But, ultimately, there is a big difference between gambling and investing. In gambling you may win in the short term, but you'll always lose in the long term. In investing, you may lose in the short term, but, if you follow the rules, you should win in the long term. That's the big difference. But I think you make your own luck, I really do. Certain people who are "lucky," work a little harder. They have a little more skill. And who are the ones calling them lucky? – The guys who are making all the mistakes.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

JM: Very definitely. I don't know what to think about astrology – maybe it works, I don't know. But technical analysis is the study of markets based on tangible evidence – a market is going up or it's going down. What the position of Mars and Venus has to do with the market, I don't understand. That's not technical analysis. You are looking at something outside the market, out in the universe. I don't see how that comes under the heading of technical analysis, because you are not studying the market, you are studying the stars. What really bothers me is when some of these astrologists are identified as technical analysts. That really bothers me because the average person is going to laugh at that and is going to say, 'These technical analysts, they're all lunatics!' It really bothers me, because what we do is serious work, and what we do is basic economic analysis. If you boiled down what we do, you would see that what we are doing is sound economic analysis – it has nothing to do with the stars. Now, some of these astrologists have pretty good track records, so I don't want to disparage astrology. I just don't think it should be called technical analysis. Call it astrology, that's a whole different thing.

J: So how do they manage to maintain good track records?

JM: I honestly don't know. I've often suspected that some of them are just very good chart readers. Some of them do use some technical analysis. If you push them to the wall a little bit and really question them, they'll very often refer to a chart pattern or something like that. I don't know if they are doing astrology. I just don't know.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. are the laws that underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

JM: I have studied the Elliott Wave, and it's fascinating. The theory behind it is fascinating, and I am sure that there is some truth in it. I use the Fibonacci sequence quite a bit in my work. I've seen it work many, many times. In fact, it's very commonly used in the markets. It's a fascinating theory, and there have been times when it's worked beautifully. Now, the Fibonacci numbers are part of the Elliott Wave, and I use that quite a bit. In fact, it gets used by most traders. For example, if the market had been going up for a while, and it comes down, it tends to retrace about 38 percent or 62 percent. I don't know why those things work, but they do work, and we pay a lot of attention to them. Maybe it's a self-fulfilling prophecy. If the market has been going up for 13 weeks or 21 weeks, I take notice of it. So there is obviously something to it. I do use Elliott Wave at some times in my work, if I find it very clear. I just find that the margin of error is high. I've seen Elliott Wave people get on the wrong side of the market and stay on the wrong side. My attitude is that it is not our job to necessarily even predict or outsmart the market (though some people say it is). Our job is to read the market's message and be in tune with the market. More and more I am finding that, in my money management work, all I want to know is whether or not the market is going up, because if it is, then we want to participate. We don't consider ourselves to be overly smart, but we track what the smart money is doing. By seeing which stocks or groups are going up and where the volume is going, you can tell where the money is going and where it's coming out of. So what we try to do is figure out what the market is doing, where the money is going, where it is coming out of, and we just want to follow it. We are not trying to outsmart it, we are not trying to outguess it, we are not even trying to predict it. We are just trying to be in tune with it – be in the right places at the right time. I've never totally understood all the nuances of Gann. I just don't think that this has to be that complicated. I happen to be a believer in simplicity. Using all kinds of esoteric, complicated theories is unnecessary.

J: If things like Elliott or Gann confirm what your own models/strategies/interpretations are telling you, does that make you even more confident?

JM: Yes. I do have an eye for the Elliott Wave patters, because I've been doing it for a

long time. There are times when I think I see patterns there – for example, I see the market going up in 5 waves. Normally, if the market is peaking and then it goes down, it will only go down in 5 waves; then it will rally, and go back down again. That suggests to me that this is corrective in nature. If I see 5 very clear up-waves, I become very cautious about something, but only when I see it. If the market shows me the pattern, then I pay attention to it, but if I don't see it, then I don't look for it – to me it's just not there. So I do use some of it in my work, I just try not to force it. A lot of people, when they first start out in technical analysis, they look for price patterns everywhere. Once in a while you see a price pattern, but more often than not, you don't. You don't have to see a price pattern, all you really have to know is whether the market going up or going down. You have to be in tune with the market.

J: So you do think there is some validity to these theories?

JM: Oh, yes. I think so. I just don't think you can rely on them exclusively, that's all.

J: There is even some validity to Gann?

JM: I know people who swear by it, so there must be something to it. But I think it's dangerous to start with those things because there's just too much margin for error. Start with the simpler things that are easier to read.

5.11.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis? Did you become more or less convinced since when you first started?

JM: No, I don't think so. I liked it early on, it made sense to me. You only start becoming convinced over the course of several years, when you start applying it. In the early days, you start applying it and you kind of close your eyes and cross your fingers a little bit. Now I expect it work. In those days, I was actually a little surprised when it worked. I'd say, 'Yes, this really works!' Also, after you come up against the fundamental and the economic communities in many instances – these are very smart people and there are fifty of them for every one of us – and you see how often we've been right and they've been wrong, you begin to develop a little more confidence in it. Now I actually expect it to work. It doesn't always work, or I may not always read it right, but I expect it to be right now, and I am a little surprised when it doesn't work. When it doesn't work, it's usually because I've read something wrong.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

JM: Yes. The lack of credit bothers me probably more than anything. A perfect example was the 2000-2003 bear market. If ever there was an example of the danger of fundamental

analysis – and the value of technical analysis – it was at that time. Markets peaked in early March – I was predicting it, and a lot of other technicians were predicting it as well. We saw it, we moved out of the market, saved a lot of money. We predicted a recession. It took the economic world six to nine months to spot that something was going wrong. They didn't actually declare a recession till twelve months later. If there was ever an example of the market leading the economy, it was then. And, yet, how did the media react to that? Immediately after that, they stopped interviewing technical analysts. I couldn't understand that. They kept interviewing the same people that had been wrong all the way down, rather than those of us who had been right. If you look at CNBC now, they very rarely interview technical analysts. This should have led to the golden age of technical analysis, and yet they are not giving us any credit. That bothers me. As far as the academic community is concerned, what always struck me is that there is a conflict of interest there. The academics teach about the stock market, but none of them make a living in the stock market. They only teach about it from a textbook, and they tell us what works and what doesn't work. In a sense, what we are saying is that a lot of what they teach is irrelevant, so why would they look on us favorably? We are saying to them, 'If you follow the market and if you follow the charts, a lot of what you are teaching becomes irrelevant.' So there is a conflict of interest. But, interestingly, as you've probably heard from other people over the last few years, there are at least thirty universities that now teach technical analysis. A lot of them use my textbook. There is a lot of interest in this area. Also, there is behavioral finance. I've seen a couple of big articles written up in the New York Times just recently about how professors are now coming up with a new theory that you can beat the market by studying human psychology, but everything that I've seen them describe, is pure technical analysis. So, after condemning us for all these years, they are now basically copying what we are doing, renaming it, and trying to take credit for it. The New York Times wrote a front page article about the values of behavioral finance, but I've never seen them write an article on the values of technical analysis, even though it's essentially the same thing. Behavioral finance is reading the psychology of the market, just like technical analysis is doing. But, ultimately, as I get older, I don't care that much any more. I feel that my job is to do what I do, and do the best job I can for my clients. If the academic world doesn't like what I do, it doesn't bother me.

J: So the lack of credit the academic community gives to technical analysis bothers you because of the fact that you are not accepted, but does it also shake your confidence in the validity of technical analysis itself?

JM: No, it shakes my confidence in the academic community. The academic world is where the economists come from, too. I once wrote a paper when I was getting my master's degree in business back in the 70's. As I mentioned I was at Merrill Lynch at the time. The paper was for a course on market analysis. I asked the professor if I could write a paper on charts, and he said, 'Yes, OK, go ahead.' So I took a case study of a prediction I had made in one of the markets, where the market was turning up – Merrill Lynch made a lot

of money on this particular trade. I got it back, and he gave me a D. He said, 'Nice try.' I went up to him, and I said, 'Excuse me, why a D?' And he said, 'But that stuff doesn't work.' And I said, 'This was a real life case study. I do this for a living. We saw something happening, made a prediction, bought the market, and made a lot of money.' But he kept insisting that technical analysis didn't work, and wouldn't change the grade. Despite the fact that I did this for a living, he wasn't convinced. So, yes, the lack of credit bothers all of us. That's why there is a movement now to obtain the recognition we deserve. It's not going to benefit any of us personally. It's not going to have any effect on our lives one way or the other. Many of us senior analysts are near the end of our careers, anyway, so we could care less. But it would be nice at some point to have someone say, 'These guys, what they did made sense, there was validity to what they were doing.' I guess I'd like to hear that, but it's not going to affect my life too much one way or the other.

J: Do you think there is any truth to the random walk hypothesis?

JM: I don't think anybody believes that any more. That was developed in the academic world 30-40 years ago. I don't think even the academic world believes in that any more. The idea that prices don't trend is just wrong – all you have got to do is look at a chart to see it's wrong. The stock market went up from 1982 to 2000 – that's an 18-year trend. The random walk says that there is no trend.

J: What did you think of it when it first came out? Did you immediately know it was wrong?

JM: I obviously disagreed with it. I remember the book very well. For some reason, random walk is often used to show that technical analysis doesn't work. What I've often said is that if the random walk is true, then security analysis doesn't work either – if we can't predict the market then you can't predict it either, because there is no trend. In the couple of books that I've written, I show a chart of a market that just goes down over time, and I say, 'tell the people who lost money that there is no trend in this stock.' The idea that what happen yesterday doesn't affect what happens today just makes no sense. But I think that's been largely discredited, even in the academic world. You don't hear too much about that any more.

J: What, in your opinion, is the best proof of the validity of technical analysis?

JM: The best proof is in our track records and in the fact that most of us you are interviewing have survived in very difficult environments. Of those of us who manage money or make recommendation, track records have been kept, and we've done very well. That's ultimately the best proof. You can go back-test all kinds of things. We started managing money about six years ago on a purely technical system, and we outperformed the market during those entire six years. We outperformed it dramatically during the bear market. If

someone were to ask me for a proof, I'd just say to them, 'Look at the record.' You just need to look at the record – what else is there?

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

JM: Sometimes. I don't agree with everything that's been written. As I mentioned, in the early days I learned my technical work with Edwards and Magee – their famous book was written back in the 1940's. In it there is statement that this stuff doesn't work in the commodity markets. Well, I applied it to the commodity markets, and it worked extremely well. I don't agree with everything I read in the technical literature. I don't disagree with too much of it, but everyone has their own emphasis. In my early years I was always very careful to try to stay within the rules and within what someone said was the right way to do it. Now, I just follow my own thing. I don't worry about the rules too much. If I disagree with something, it doesn't bother me. By the way, I've also disagreed with things that I've written in the past. On occasion, I'll be in front of an audience and I'll make a statement about something, and someone will say, 'I thought that pattern was bearish.' And I'll ask, 'Where did you read that?' And he'll say, 'In your book, page 383!' I'll say, 'I wrote that 20 years ago. I don't think that anymore.' Even when I read some of the stuff that I wrote 20 years ago, I don't agree with all of it. We change. When anyone writes something down, whether it's me or somebody else, that's their knowledge at that point in time. It's like taking a picture of someone when they are 12 years old and looking back at that when they are 82. Do you still see the same face? When you write a book, that's the body of your knowledge at that point in time. You are going to evolve, and, 10 years later, hopefully you'll know more than you did then. You are going to look back at things that you wrote, and you are going to say, 'Gee, I don't think that way any more.' So, sure, I've contradicted myself, changed my mind, or given different weight to things – there are certain things that I thought were more important 20 years ago, but which I don't think are as important now. I've disagreed with Edwards and Magee, with their statement about the inapplicability of technical analysis to commodities, for example. It's not so much disagreeing, it's that they wrote about the markets 50-60 years ago, and the markets now are very different. For example, we didn't have sector trading back then. So it's not so much a matter of disagreeing with what they said, it's that what they said doesn't cover a lot of what we do now. So it's not that I am in a major disagreement with them, it's just that what they said doesn't go far enough.

J: Would you say that in technical analysis there are no hard and fast rules and no proven theories?

JM: I would say that that is not true. I think there are rules. There is a body of knowledge. There is a set of rules, which you can program it into a computer, and you can do a fairly good job relying on your program. I think a good analyst sometimes can improve on

that. If there is no body of knowledge, there is nothing to it – then it's just witchcraft.

J: Are there are things in technical analysis that are scientifically proven?

JM: Depends what you mean by scientifically proven. How would you scientifically prove it? I am not sure. You can take many of the indicators and many of the systems that we use today – I've done it myself and I've seen others do it – and prove that if you had followed a certain technical system, you would have made a lot of money over the last 10, 20, 30 years. So you can test that historically. Then you can take track records of technical analysts. Now, what I've seen happen in the academic world is that if you give them a winning record, they'll say, 'But he is an exception!' So you can never win the argument. I can show you my track record – we've been managing money for 6 years, we've never had a losing year, even in the bear market. The academics would say, 'Well, you are the exception.' But, whenever I am asked that, I say, 'Can anyone prove that security analysis works?' How would you do that? Has anyone ever done that? I am always asked if I can prove that technical analysis works, but why isn't anyone asking the question for economic analysis? Can you prove that economic analysis works? So if you want to go back and rigorously test us, that's fine. I don't mind that. I think we'll hold up very well. But let's test the other people too, and see if they hold up. They are always the ones who are asking the question.

J: Do you believe that technical analysis works even when applied to data other than the market action data (e.g. the weather data)? If yes, how is that possible? If no, please explain.

JM: You can certainly spot trends trend in it. But I think applying technical analysis to weather data is going a little too far, because ultimately what we are doing is studying trends of the market and also studying psychology. There is a psychological element to it – fear and greed and all this kind of stuff. For a lot of the patterns that we talk about, you can explain psychologically why they work. Once you get into nature, which is what I think you asked about, I wouldn't call it technical analysis, though, certainly, you can plot trends there. I've seen charts going back a 1000 years of all kinds of things. There is a 20-year war cycle, a 10-year sun spot cycle, and there are studies about how these cycles affect the price of grain. There are all kinds of fascinating things there. You can plot trends, but I wouldn't call it technical analysis.

J: Would it make any sense to look for a head and shoulders pattern in weather data, for example?

JM: Interestingly, I used to work at CNBC, and I've had calls from weather forecasters who have been intrigued by the kind of work that I was doing on the air. They used to say there was a lot of similarity between what I was doing and the weather forecasting. I like to think we have a better track record, but there are certainly similarities. If you look at some of their patterns, it does look somewhat similar. I like to think of technical analysis as the

study of market. Maybe it has wider relevance – I don't know.

J: To what extent do technical patterns and indicators capture human psychology, and the law of supply and demand?

JM: I think they do to a large extent. But, ultimately, if you think about it, even if you were to plot temperatures from a day to day basis, if you were to plot the average daily temperature going up over the course of a year, you can clearly see that the temperatures start going up in the spring and start going down in the winter. You could do a point and figure chart of that.

J: Is there going to be a head and shoulders there, or is the head and shoulders formation totally the result of greed and fear and the law of supply and demand?

JM: There might be. But if there were one, it would be a coincidence, more than anything. From an analytical standpoint, I don't see why you would have a head and shoulders, a double bottom, or something like that. You may see some of those formations, but there are not psychologically induced. I know some academic studies show that you can randomly create chart patterns by the flip of a coin. They say, 'Well, by flipping a coin, we can create a head and shoulders top.' And I say, 'Yes, but what's the relevance of that to the markets? You can create a head and shoulders pattern by flipping a coin, but what does that tell you?' Their argument is that that means that head and shoulders patterns are fictitious. I don't see how you can make that leap. That gets a little too esoteric for me. All I know is that you can use some of these techniques in weather forecasting, but I don't know if I'd really consider it technical stuff. You can use some of the same tools, but what you are doing is not technical analysis, it's something else I think. I will say this though: I wish we could drop the term "technical analysis." I don't like the words. I don't understand what "technical" means – it has no meaning. I would much prefer the term market analyst or market strategist, because the minute you use the term technical analyst, the media and the industry have a very narrow view of what you are capable of doing. What I do goes far beyond traditional technical analysis. I try not to use the term too much. There are a lot of technical people out there, who are market strategists, chief analysts, or money managers, who use technical analysis, but that's not their title – they are money managers or they are market strategists. They use technical analysis, but they are not called technical analysts. If someone says, 'You are a technical analyst,' that means technical analysis is all you do. So I don't like the term – it's very limited – and I don't use it much.

5.11.10 Lifestyle

J: Could you describe your working day?

JM: I get up early in the morning. I usually wake up around 6:30. I put Bloomberg

radio on, and I don't get out of bed until I've listened to Bloomberg for about half and hour. What I like about Bloomberg is that they give all the overnight data about what the markets have done in Europe, what the markets have done in Asia, the dollar, gold, oil, etc. That gives me an idea which stocks to watch that day because of what's happening in Europe and elsewhere. Before I even get out of bed in the morning, I have a snapshot idea of what kind of day this is going to be or how it's going to start. Then I read several newspapers. I read the New York Times – I read the sports subsection first, but then I get to the financial stuff. I read Investor's Business Daily – I go through that rigorously. I also read The Wall Street Journal. That's before I go to work. When I get to the office, I scan everything that's happened overnight. I look at what's been up and at what's been down. Then, after the market opens, I go though a checklist of stuff. So I put in a good 3 or 4 hours in the morning, just trying to get a feel and find out what's important, because there is a lot of noise in there. I am always looking at what's happening. By 9:00 or 9:30, I've gotten all the data for our decision model. I review our positions, see if I need to upgrade or downgrade something, or make any changes. These decisions are usually made before 10 o'clock. I also write for our website, StockCharts.com. Then I do some analysis, and answer my email. Usually by noon I take a break. I go away for a couple of hours. Sometimes I take a nap, sometimes I go to the health club, but I just get away from it in the middle of the day, because, there is really nothing going on. Then I come back in the afternoon – there may be a trade we were looking to make near the close, and I usually write a market wrap-up. I may work till 5 or 6 o'clock. Very often I'll watch business shows – like I'll watch the Nightly Business Report as often as I can. Saturdays I read *Barron's*, Sundays I read *The Sunday Times.*

It's like a big, never-ending chess game. It's not that I am a workaholic or anything like that, but to be good at this you have to put a lot into it. I bumped into someone recently who knows the famous pianist Van Cliburn really well. Cliburn is considered the top pianist in the world. He gives concerts around the world and gets paid a lot of money. He was a young American pianist back in the 1960's and is in his mid-60's right now. Someone told me he practices 5 hours a day. This guy I recently bumped into asked him, 'Why, after all these years, would you still practice?' Cliburn replied, 'That's why I am the best.' (I am not implying I am the best, he's saying that.) Here is the man who is arguably the greatest pianist in the world, and he has to practice 5 hours a day. If he doesn't practice 5 hours a day, he doesn't feel on the top of his game. People, in any field, who are really good at what they are doing, are those who do a lot of background homework. Believe it or not, maybe half of the reading I do every day is fundamental. I am trying to understand the relationships. Like, for example, a couple of weeks ago we got a very weak durable goods report. And the dollar went down, while bond prices and gold prices went up. All kinds of other things happened, all because of that report. So I am trying to understand why that would happen. It fits in with my technical work, but I am trying to understand the dynamics. So I do a lot of fundamental reading.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price

moves so that you can live without stress?

JM: Live without stress? I haven't gotten there yet, but I am getting there. I started meditating recently – working out a little bit more and meditating. I don't think you can ever eliminate stress. Again, as you get older, you have a bigger perspective on life. The market isn't life and death any more. When you are younger, when you are raising a family and trying to climb the corporate ladder, it is almost a life and death situation. It isn't that any more. You become a little more detached from it. It becomes more of an intellectual exercise. If you connect the dots right and follow the rules pretty closely, you are not going to go too far afield. And if you make a mistake or something doesn't work once in a while, you say, 'Well, it just didn't work this time.' I could never eliminate stress, but I do think that it isn't as stressful as it used to be.

J: In the beginning it was very stressful?

JM: Oh, yes. It was very stressful. Your age has something to do with it. When you are first starting out, and you are trying to build a career and a reputation, you are starting with nothing, you are a nobody, and it's very stressful. As you get older, you just mature a little more. You don't live and die with the markets. Markets can take over your whole life, if you let them – you have a bad day in the market, and you go home and kick your cat. After a while, at the end of the day you just shrug your shoulders and say, 'Well, it wasn't a good day, but tomorrow will be better.' So you just take a philosophical stand. You hope to be right more often than you are wrong. If a baseball hitter gets a hit one out of three times, he is considered a very good hitter. So, you know, you strike out once in a while.

J: How many hours each day do you spend practicing your craft?

JM: That doesn't include nap time, right? I like to think that some of my best ideas come to me when I am sleeping! I would say I spend about half of my day practicing technical analysis.

J: How many hours?

JM: I don't put in a full 8 to 10 hour day any more. I believe in quality as opposed to quantity! Let's say I work fewer hours than I used to. I think of myself as sort of semi-retired now, but I don't think it's necessary to work very long hours to do good work.

J: Are markets always on your mind?

JM: Yes. To me it is sort of like a chess game. It feels like a chess game, especially the way I do it – I am looking at so many different pieces. I could be sitting in a movie theater or watching a baseball game, and I may find myself thinking about it a little bit –

Why is the dollar going down? Why isn't this or that happening? So there is a little bit of that. Sometimes I am laying in bed at night, thinking about the market, and trying to figure something out. So I wouldn't say it takes over my life or anything like that, but I am trying to make decisions constantly. It doesn't take over my life, and I don't think about it all the time, but it's a mental challenge, which I kind of enjoy.

J: So it's a passion more than anything?

JM: I think so. I thoroughly enjoy it. It's a tremendous intellectual challenge, especially the way I go about doing it, with the intermarket analysis, because I am looking at how what's happening in Japan affects what's happening here, or I am trying to figure out what's happening in China and the impact that's going to have here. It's a big puzzle. It's interesting, and it's very intellectually stimulating.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[19].

Would you agree with de la Vega? To what extent does your trading control your life?

JM: That quote may be true for some people. Early on in your career, especially, it can take over your life. And I think of a lot of younger traders that I knew – it's like all they talked about was trading. I know some people will tell you that their whole life revolves around it. As you get older, that's no longer the case. I don't think about the stock market all the time. And, as you get older, you find that there are other things in life – your family and your health, for example. As you get older and start losing friends and family members, you realize there is more to life than the stock market. Shares aren't everything. There is obviously some truth to that statement, but I think you outgrow that after a while.

J: Is this quote applicable in its full intensity to your early career?

JM: A few years back, when we were in the last stages of a stock market bubble, every place I would go, people would be asking me about the stock market. If I went to the barber, the guy would be asking me about the stock market. I'd go to the health club and I'd be using one of the machines, and all the doctors would be standing around. They wouldn't even be working out. I heard doctors say how they quit their practice to trade the markets.

[19]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

They were all day-trading. And, of course, the market was going up, so they thought they were geniuses. It was incredible – doctors quitting there practice to trade. It was all they talked about. Of course, it's always said that that's a sign that the bull market is almost over, but that goes on for a long time. Every place I went, the only thing people talked about was the stock market. Then we went into a bear market, and, after a while, people stopped talking about it. So I think there are certain times when the market is really hot and people are making a lot of money. There are manias, I guess, but all the day-traders disappeared after the market peak.

J: How about you personally? Was the hold the market had on your life in the beginnings of your career as strong and as intense as portrayed by this quote?

JM: I would say yes. Just to go back and repeat what I've said earlier, after about 15 years of trading, I had to quit. I was so burned out and so emotionally drained. I started developing physical problems. You know the old joke where you go to a doctor and say, 'Doctor, my arm hurts when I do this,' and he says 'Don't do it!' I remember going to see the company doctor quite often, and he said to me: 'God, you've been through an awful lot. Boy, your medical file is gigantic!' And he asked me, 'What do you do for a living?' I said, 'I am a commodities trader.' He said, 'Don't do it any more! You have got to make a life-style change.' So, yes, for me it was emotionally draining. I'd walk out of the office and my whole mood would be determined by the market. If I had a bad Friday, then I would be grumpy all weekend. It affected me. I think this is true if you are trading a large amount of money in very volatile markets. And I was trading by myself – which is true of a lot of traders. By my mid-30's I was just totally burned out, I was a basket case. So, yes, I do think that quote held in its full intensity for me early on. And then I decided to do something else for a while. But now that I am back to it again a little bit, I have a more detached attitude about it, and I think I am better than I was then.

J: Did you have to consciously work to create a balance in your life?

JM: No, I think it happens naturally as you get older. It's a maturing process.

5.11.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

JM: It's interesting, in the early days we used to pride ourselves on not knowing anything about anything – all we did was read the charts. But I actually have a bachelor's degree in economics, which, interestingly, I hadn't used for a long time. It's only in the last 5 or 10 years, when I've gotten into the intermarket work, that I actually found myself going back and rereading some of this stuff, or, since my college books are outdated, reading a little more about economic theory. I also have a master's degree in business administration, which

I don't think ever had much of an impact on what I do. I would say it is good to know something about economic theory. Also, quantitative skills are very important today. Some of the older guys – there's a whole bunch of us – probably couldn't get a job today if we were starting out. We are considered the experts, only because we are the oldest, but most of us probably couldn't get a job today in this field, because we don't have the quantitative skills. Some of these young people coming in – my own son, who is studying computer engineering, is an example – can do amazing stuff with the computer. Most of us are kind of clumsy with the computer. So, I would say that statistical and quantitative skills are really important, and maybe some knowledge of economic trends would be useful as well. And, of course, it's always good to have a balanced education.

J: Can creativity required by the practice of technical analysis be enhanced by formal education?

JM: It's funny, I recently took up painting. I was doing an interview at some magazine recently, and they asked me about that. They said, 'Why would you be interested in painting?' I said, 'Well, you know, I sort of felt I was drawing pictures all my life.' Whenever we talk about something, we always show a picture. We are always working on color schemes, always trying to make the picture look attractive and appealing. So there is an artistic element to it – colors, symmetry, and all this kind of stuff. It seems to me painting is a natural extension of that. I think the creative part isn't something that's taught to you, though. It's something you pick up over time.

J: Are verbal skills and communication skills important to work on?

JM: Very important. I was lucky, because when I retired from trading in my mid-30's, I taught technical analysis for a few years, so I got very comfortable talking in front of audiences and explaining this stuff. Later on I worked on television for several years. That's even more challenging, because you only have a few minutes to make your point. You have to be very much to the point and very clear. You can't use technical jargon, and your pictures have to be crystal clear. So I do think communication skills are important. I would give two pieces of advice to technical analysis students. Number one, avoid using technical jargon. If you are talking to a technical audience that's fine, but most people we talk to are non-technical. Whether you are talking on TV or you are talking to a group of money managers, you can't use technical jargon. You just have to get away from it – that's probably the best advice. And, number two, don't overwhelm people with information. Sometimes, when I worked on TV, technical people would send in these charts with 15 lines on them. I learned that you can't use more than two lines on a chart most of the time. People see it for 5 seconds. Communications is an area where we, as an industry, may be somewhat lacking. We haven't done as good of a job as we should have with communicating our ideas without using a lot of jargon and with really thinking through why this works. For example, I have to think about why whatever I am about to tell this audience makes sense from an

economic standpoint, as opposed to telling them 'you have to buy this because we have a head and shoulders bottom.' That just doesn't work. So I think we probably could improve our communication skills.

J: What advice would you give to technical analysis students? What is the key to success?

JM: First of all, you have to learn the field – as I've mentioned, there are some courses taught at universities. You should join the Market Technicians Association, and you should attend meetings if you can – there are chapters all over the country now. You should also take the CMT program, which is a 3-year program, because it forces you to learn the subject. Before you can become creative, you have to know the rules, so you have got to put in a few years learning the rules. Read the books. It's like any other thing – you have got to learn the basics. Also, you have got to learn the quantitative skills. But, I would also advise you not to get too caught up in the really complicated stuff. There is a tendency with younger people, especially with computers now, to come up with really fancy and complicated stuff. If there is a shortcut I could offer to them, it would be 'appreciate the simplicity,' but maybe it's the process you have to go through yourself. The older guys tend to eventually come back to the simplicity of it, but I am not sure that's the place you can get to without going through the complexity of it first. So just learn the basics of it and put in your homework, then attach yourself to something like the MTA, where you can get plugged into the industry.

5.12 An Interview with Robert Prechter

5.12.1 Definition

Q: How would you define technical analysis?[20]

RP: Let me give a short answer and then a longer explanation. Technical analysis is the study of data pertaining to the actions and mental states of the participants and commentators in a financial market in order to predict prices in that market.

This definition is as opposed to fundamental analysis – a misnomer in my opinion – which is the study of data pertaining to forces *outside* the market in question in order to try to predict that market. So technicians study a market's "internal" state, through data pertaining to what investors and commentators are thinking and doing, what prices and volume are doing, patterns of market behavior, and so on. Fundamentalists study external data, such as corporate earnings trends, the economy, political developments, levels of supply (such as in commodity markets) and other financial markets that are presumed to impact the one they wish to predict. In my opinion, a better term for technical analysis is market analysis, because we analyze markets. Not companies, not stocks of grain, not economies, not the Fed and not politics but markets.

Q: Does everyone use these definitions?

RP: No. By my definition, some self-described technicians are fundamentalists and vice versa. "Technicians" who study one market to predict another are actually fundamentalists, because they seek out reliable external causes. Graham and Dodd called their approach fundamental analysis, but in my opinion it is primarily technical because, although it uses company data, it compares it to the stock price, so the ultimate revelation from such information is the relative state of investor psychology with respect to various individual stocks. If stock A is cheap compared to a benchmark, and stock B is expensive, you have some idea of potential, in most market environments, anyway. Comparing prices to dividends (the P/D ratio) is a purely technical approach, because the purchaser of a share of stock buys only one thing: an income stream – current or projected – from dividends. So the dividend payout is wholly internal to the stock market. Predicting earnings trends is in the fundamentalist camp, because earnings are an aspect of *companies*, while dividends, you see, are an aspect of *stock*.

Q: What about the P/E ratio, which is an aspect of both?

RP: P/E is a technical indicator, but by incorporating fundamental data, it is removed

[20]This was a cyber-interview, where questions were submitted to Mr. Prechter over the Internet and he replied in writing. In the process, Mr. Prechter added some of his own questions; such questions are marked by a "Q" to distinguish them from the interviewer's questions, which are preceded by a "J." In particular, the questions in this subsection only are Mr. Prechter's own questions.

by a major step from pure technical analysis. It's a hybrid, which is one reason that it is less valuable than P/D.

Q: Why not just say that technicians study supply and demand in financial markets?

RP: A common fallacy among financial market theorists is to equate those on the sell side of a stock transaction with "producers" and those on the buy side with "consumers," representing supply and demand, but this analogy is spurious. In the world of transactions for a utilitarian good or service, producers and consumers are separate entities. In the stock market, a "supplier" on Tuesday will be a "demander" on Wednesday. So buying and selling in financial markets are in fact two sides of the same coin, and that coin is demand. When a person's level of demand rises, he buys, and when it falls, he sells. Anyone who provides the initial shares of stock to the marketplace is a supplier. Everyone else, from then on, is a demander. So, vacillating demanders make up nearly the entire market for stock shares. In essence, technicians study the patterns, actions and psychology of fluctuating aggregate demand.

Q: Do you think someone can get along with technical analysis only, with no fundamental input?

RP: I will go further and say that with respect to predicting aggregate markets, fundamentalist input – by which I mean data from outside the marketplace, such as data on the economy or interest rates or Fed policy – reduces the value of market analysis to the extent that it is incorporated. When certain types of fundamental data – such as earnings or book value or economic performance – are linked to market *prices* to determine comparative values, they can become technical indicators.

Q: But wouldn't most people say, for example, that Enron stock collapsed because of fundamental problems?

RP: Yes, but I think that's false. The way I formulate what happened is that the collapse of Enron stock precipitated the problems that caused the company to go bankrupt. The company was unsound from the beginning, of course, but its stock price soared for years anyway. The bull market provided the optimism for the stock as well as the financial leverage for the company's operations. When optimism turned to pessimism, it all fell apart. If you want to predict *stock prices*, you can't start with fundamentals. Now, I want to be clear: If an analyst compares measures of corporate valuation to a stock's price, he is entering the realm of technical analysis. So if someone decided that Enron was "overpriced" on that basis, he would be making a technical statement about the psychology of the stock's investors. But simply pointing out great management or company problems means nothing without regard to price.

Q: Do fundamentals play any role?

RP: Yes. They lag. In *The Elliott Wave Financial Forecast*, we called the top in Martha Stewart's stock when it went public in October 1999. Her famous problems arose several years later. A good technical call *anticipates* fundamentals. When she went to jail, the stock was tremendously depressed, so then it was a buy. The stock rose again, and after it did, Martha got out of jail and resumed being a producer for the company. Then the stock started selling off. Observe how the fundamentals follow the technicals. That's why fundamentals alone are not useful predictors.

5.12.2 The early days

J: When did you first get interested in technical analysis?

RP: I was exposed to it in the late 1960s and got really interested in the early 1970s.

J: What first triggered your interest? Did someone or something in particular inspire you?

RP: Yes. My dad sent me copies of Richard Russell's *Dow Theory Letters.* I thought Russell's reasoning was sound, but I didn't understand the make-up of technical indicators such as the advance-decline line. Every half-year or so, he would explain it, and I would read the paragraph three times to get the point. Later I got a booklet from a brokerage firm explaining the most basic technical indicators. The first one, I remember, was the Dow Jones Industrial Average! Boy, it seems hard to believe that there was a time I didn't know how it's constructed.

J: Did you have a mentor? What was his or her role in your development as a technical analyst?

RP: I would have to say that my mentor, from a distance, was Russell. I wanted to do what he did for a living. His letter was the first place I saw a discussion of the Wave Principle. But many people have taught me things over the years, including the staff at the Merrill Lynch Market Analysis Department, where I started in 1975. That's where I learned about indicators.

J: Did you learn the craft by studying the literature on your own, or with a teacher?

RP: I got most of my education from books, and I read a lot of them, mostly on Dow Theory and cycles, and of course R.N. Elliott's books and articles, which I went to great lengths to locate. I focused on approaches that gave you a prayer of *predicting.* Everything else was irrelevant, as far as I was concerned. I never had a teacher. In fact, in 1975, market analysis departments at brokerage firms were typically one guy. There was nobody

to do the teaching, and no one was holding seminars. In college, twice I tried to get into a course on mass psychology, but it got canceled both times. But it turned out to be my field.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your analysis?

RP: I thought it was valid from the get-go, so there was no acceptance curve. I started applying it about a year after I took my first investment position. That didn't mean that I was prepared, though; I just thought I was.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

RP: Two things. First, I have discovered things about waves – subtle, remarkable things – that others hadn't noticed, such as quantitative relationships between certain waves. Second, and more fundamentally, I came to a realization in 1979 that the *implications* of the validity of technical analysis for society and history are utterly unappreciated. I am trying to found a whole new field, which I call socionomics, to explain this idea and use it to forecast financial, macroeconomic and social trends.

J: Which mistake did you learn the most from?

RP: The biggest mistake I ever made with respect to market forecasting was to use up valuable effort thinking about fundamentals from time to time in causal terms. They never help in forecasting stock market trends, or even currencies or commodities. While I have always known to ignore 99% of fundamental data, I did not fully root them from my mind until the summer of 2002, when I wrote "A Socionomic View of Central-Bank Causality." Truth comes in principles. You can't have exceptions to a valid principle. If you do, either your principle is wrong, or you haven't thought through the matter hard enough.

I want to clarify something here, though. Being wrong in forecasting a market does not mean you have made a *mistake*. This is a probability business. If your principles are sound, you will be right a certain percentage of the time, which means that you must be *wrong* a certain percentage of the time. So being wrong is a consequence of doing the *right* thing, not "making a mistake." I hate it when journalists ask what error we made last month when the market didn't go our way. Most people wouldn't ask a .400 hitter what *mistake* he made in grounding out to first base in the 5th inning. Most people can understand that baseball is a matter of percentages, but they don't see this when it comes to forecasting. The best analysts are still wrong a lot. Now you can see why the public always loses. It thinks that being right means *always* being right, and being wrong is a "mistake."

Of course, we're learning more all the time about market analysis, so some mis-calls come from a lack of knowledge. That's the excuse I use, anyway! But let me give you an example of what I'm talking about at a deeper level. If I'm a market historian, I take history as a

guide to what's possible. When markets make new history by breaking all previous measures of extremity, my knowledge of history kicks in and I get increasingly adamant that the trend should end soon. Sometimes it goes on way longer than I could imagine. Now, should I "learn" something from this rare outcome? Should I learn, for example, that you can't trust history? But I know that you *can* trust history, but only as a basis for *probabilistic* expectations. If I were to "learn" that you can't, I would be in a state of uncertainty all the time, and I would abandon a tool that has given me some successes. There's being wrong, and there are mistakes; they are not the same thing.

5.12.3 Personal style

J: Could you describe your own distinct style of technical analysis?

RP: I use a model of the market called the Wave Principle, which is a robust hierarchical fractal comprising quasi-geometric forms. It is not a designed model but a distillation of empirical observation of what markets actually do. The Wave Principle is the template against which to judge every market action and indicator. It gives me a context in which to think.

J: How much of what you learn from others do you directly apply in your analysis?

RP: I don't get much current-time analysis from others, if that's what you mean. Sometimes really smart people have great insights about a market. But they, too, get it right only probabilistically. I have found that when I listen even to smart people, it just provides a crutch when I'm uncertain. Then I combine our rates of being wrong, and the result is worse than if I had not listened. I haven't read a *Wall Street Journal* or *Barron's* or watched financial TV for 15 years, and I haven't even read the best market letters for at least 5 years. On the other hand, this was a late-stage decision. You can learn a lot from market letters, and I read them for 30 years.

J: How do you learn what works for you and what does not, without making big losses?

RP: Gains and losses have to do with trading and investing. I'm an analyst. They are utterly different things. Some people build airplanes. Some people fly 'em. I can make money trading if I do nothing else. But when I'm trying to run a company of 80 people, publish monthly commentary, write books, make speeches, create a non-profit foundation, do media and sleep 8 hours a night, there is no way in the world that I can also trade successfully. Trading is a full-time job. So is analysis and publishing. I don't want to die with nothing but lots of money. I want to die with some sort of legacy.

If you are asking how a *trader* can learn what works without losing money, he can't. The only good traders in the world are ones who lost money when they started. Do you want to know why? Because *everybody* loses money in the market early in the game. The successful

ones learn to stop doing the wrong thing.

J: Is your analysis more effective when you are working by yourself or when you are working with others?

RP: By myself. But I don't want to sound too isolationist. Having people to bounce ideas off and to feed you data and thoughts, if you are compatible, is very stimulating. Most of us do that here at Elliott Wave International, when we want to run an analysis up the flagpole. But we never, ever, have meetings to form a market opinion.

J: In general, is technical analysis better done working individually or in teams?

RP: Individually! Shall I repeat that? Read Irving Janis' *Groupthink.* He was a professor of mine at Yale. When you are a member of a group, the natural tendency is to abdicate responsibility. The best analyst is one who abdicates nothing. He blames or credits only himself.

J: In what kind of market conditions do you make the most forecasting errors?

RP: When it's open.

J: How much of what you do analytically are you willing to share with others?

RP: Absolutely everything. I used to run into technicians who didn't want to let their secrets out. Some got annoyed in 1978 that we wrote a book on the Wave Principle. What a joke. As if the public as a whole will ever wise up! It's fine to teach interested, talented people. They love it, and it's fun.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior results?

RP: Well, surgical procedures are in the public domain, too, but not everyone can say they have superior surgical results. It's a matter of how much you know, how disciplined you are, the experience you've had and how creatively you think.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

RP: I don't think there is much random noise in markets, and what is there usually lasts only minutes and never more than a couple of hours. My definition of noise is what markets do when leveraged traders react to news. It creates a brief re-patterning of *activity*, but it never alters the pattern of the underlying cause of market trends, which is aggregate *mood.*

So mood always re-establishes its motivational hold over activity very quickly.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

RP: To me, that's like asking, "Is food more effective when used on its own or when combined with arsenic?" Keep in mind that I'm not talking about Graham and Dodd and individual stocks here, and I'm not talking about valuation. I'm talking about discussing the possible impact of exogenous forces on the prices for a market. I am not aware of a reliable predictive correlation between any type of external data and prices for an aggregate financial market. Talking about exogenous causes lulls you into thinking that you have an important insight when you don't, so it encourages rationalizing, which is deadly. When you take this approach, it allows the limbic system to run wild and do what it wants, while your neo-cortex is otherwise occupied logically card-cataloguing unhelpful data.

J: How much of your technical analysis is done on an intuitive and subconscious level?

RP: None. The whole point of analysis is to *overcome* the unconscious, which is trying to force you to follow the herd.

J: There are technicians who believe that structures such as the Elliott wave, Gann's natural order postulates, Fibonacci numbers, etc., underlie the market action. What is your opinion?

RP: I studied Gann, and all I could see was numerology. Years ago I wrote a report refuting three of his claims, but I haven't published it yet. I'll have to go find it. I wouldn't say that Fibonacci numbers "underlie" market action, but they are manifest in waves. In my view, the Wave Principle – Elliott waves – are *the* market fundamental. It's a form that markets follow, just as trees, lungs and blood vessels follow a robust branching system, and just as hurricanes, whirlpools and galaxies follow spirals. As with trees and spirals, Elliott waves constitute a fundamental organizing principle of nature. More specifically as with trees, they are an organizing principle of life forms.

5.12.4 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

RP: The least reliable indicators are oscillators, moving averages, deviation percentages and other direct derivatives of price, which almost everyone uses. That is not to say they are not useful; they're just less useful. The most reliable indicators are the hardest to use, such as waves, patterns, cycles, sentiment indicators and comprehensive momentum indicators such as tick, trin and a/ds to indicate divergence, although the latter two have been

compromised in recent years. The change to decimal pricing has destroyed the value and history of the a/d line. The stock funds, bond funds and preferreds listed on the NYSE have hurt that and trin, too. As for one quasi-technical indicator, Standard & Poor's changed its definition of earnings around 2001, so the P/E ratio no longer has a 75-year history.

J: How do you test patterns or indicators? Do you ever ask for other people's opinion when you are making such decisions?

RP: We look at as much history as we can generate and see how an indicator performed. We might ask someone his opinion, for example if he developed it.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

RP: The answer could be yes, but only if you expect all market environments to be the same. Some people construct "boundaries" that indicators supposedly respect, but they behave utterly differently in a range market vs. a mania or crash. The real answer is no, as long as you have a basis upon which to judge the market environment and adjust your expectations for indicators accordingly. As I said before, the Wave Principle provides a context in which this is possible. Accomplished cycle analysts can do it, too.

J: Is the number of indicators you follow greater when you are dealing with larger amounts of money?

RP: No.

5.12.5 Evolution of technical analysis

J: How has the craft evolved since when you first started?

RP: It's mostly *de*volved. In bear market decades, such as the 1930s, 1940s and 1970s, there is technical analysis innovation going on all the time. In bull markets, most investors pay no attention to it. They revert to exogenous-cause thinking, which is our mental default. Computers have helped a lot because they save so much time in plotting.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions?

RP: I'd like to see some of them so I could answer your question! Most of what I see is the nth derivative of a momentum oscillator or the presumptive application of Fibonacci retracements without a shred of evidence to indicate its value. I know of no new chart patterns since George Lindsay's "3 peaks and a domed house" from the '60s. Candlesticks are new

to me but not to the field. I haven't learned them and probably won't, because you have to draw the line somewhere. Too many approaches will cause you to go into data overload and hurt your success rate.

J: Do you consider the new developments just to know what others might be doing, or do you also update your own strategies?

RP: I mostly do the latter. When I develop a new rule about wave behavior, it's a thrill.

J: To what extent has the introduction of the variety of computer software aided the craft?

RP: The best thing a computer does is save plotting time. I don't think much of the analytical software programs I've seen. The market is so complex to model that you can't use equations and statistics to do it. You can only model aspects of it. I think the future will be in getting computers to recognize patterns and forms despite quantitative variation. We're working on it, but it isn't easy.

J: To what extent do you rely on computer generated signals? What are the advantages and disadvantages of relying on computer generated signals?

RP: I don't use them at all. Black boxes don't interest me. They are usually programmed by people who use only a certain market history – usually the recent past – as data. If computers could get stressed, the future would do it!

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

RP: Yes for beginners, then no. Doing indicators by hand forces you to think about them. It takes time to do, and your mind is occupied thinking about them, and your memories of previous plots are very valuable. You think, "Hey, when was the list time this 10-day oscillator jumped this much in three days?" Or, "What's my drop-off number for tomorrow?" When you just see it on the screen, you tend not to think about such things. But if you have plotted by hand before, you can translate what you learned to what's on the screen. For example, I don't need momentum oscillators any more because I can tell if there is a divergence – and at what degree – just by looking at the slopes and extents of price. Having the computer do the plots saves so much time that you can do other useful things. I would never go back to hand plotting, but I would definitely recommend it for beginners.

5.12.6 The innovative process

J: What drives your innovative process?

RP: Good question! I don't know. It's probably innate. It's hard to exceed the pleasure of a new idea.

J: Do you and to what extent collaborate with others during the innovative process?

RP: It's mostly me, when I'm quiet. Or when I write. Sometimes I focus so hard when I'm writing that the ideas just coalesce. But I love debating the value of new ideas with others because it forces me to be precise. In some cases, a person can raise questions that you never thought of and which can save you from an error in thought.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

RP: Sure, whenever I'm deeply uncertain! The urge passes, though.

J: How soon after you develop a particular technical tool do you make it accessible to public?

RP: As soon as I can.

J: Why do you share your inventions with others, rather than keeping the edge just for yourself?

RP: To start with, it pays the rent. But displaying work is a source of pride. Isn't that why anyone does something creative or productive?

J: Are there analytical ideas that you developed but never shared with the rest of the world?

RP: I recently published a book – *Market Analysis for the New Millennium* – which is a grab-bag of important things I – and some others, too – had developed but weren't available. I have major ideas now that aren't in print yet, but they will be. So the goal is to get it all out there. But I also have files full of lesser ideas that I just don't have time to write up.

J: How often do you use the technical tools you developed?

RP: All the time! Except for one of them, which is so complex that I would have to stop doing other things to apply it. But it's of tremendous importance. And I did the work back in 1977. The idea is that although waves look different, they are usually copies of other waves, but their components differ by whole-number time multiples and Fibonacci price multiples. An example is in the book I just mentioned.

5.12.7 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

RP: When I started investing, I made money for six years straight, the last four trading in options. Then in early October 1979 I took a weekend off and was talked into staying another day. I returned to find that the market was in a "massacre" that began on the Monday that I was visiting relatives instead of watching the market. I lost my whole account in two weeks. It was probably the most valuable experience of my life because I knew I had to decide right then whether I was going to be a full-time trader or a full-time analyst, and I chose the latter. Frankly, a trader's life mostly stinks. A trader friend of mine sums it up as "hours and hours of boredom punctuated by moments of sheer terror." Well, that may not be scientifically precise, but people who think it's glamorous are wrong.

J: Has a big loss ever made you doubt the validity of technical analysis?

RP: No. In fact, my theory of market impulsion – which I talk about in *The Wave Principle of Human Social Behavior* – explains losses and simultaneously validates technical analysis. People don't lost money because the market is random. They lose money because it *isn't* random. It's propelled by an unconscious herding impulse that we all have. That impulse is the basis of technical analysis *and* the reason that losing money is the norm.

J: How is the way you apply technical analysis different when you are more cautious compared to when you are less cautious?

RP: Pre-existing caution and incaution are emotions that will mislead you, and they can affect your work. When caution or aggressiveness is strictly the result your work, it's justified.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

RP: The market itself is naked emotion on the rampage. When your job is to assess degrees of insanity, how can you remain unemotional? This job we have is not like building cars. It's like trying to outwit a pack of murderous inmates in an insane asylum. You can't do it calmly because you don't know what they're capable of, and they don't have to use reason. A situation like that makes using your own reason a complex task, to say the least, and we are not built to handle some aspects of markets. No one assessing or trading markets is unemotional about it.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

RP: Both. There is definitely a learning aspect. In fact, you can identify and deal with your emotions *only* if you've had experience. Book learning or paper trading alone won't cut it. But some minds are equipped better for this task and some worse, just as some minds are equipped better for music or engineering. There are many hopeless cases. There are people who cannot help regarding news as the motivator of markets and people who cannot help getting bullish at tops and bearish at bottoms. I meet them all the time socially, and when I figure out that a person is hopeless, I change the subject.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[21]*." To what extent is this statement true in your case?*

RP: De la Vega is talking about speculators, not technical analysts, and he's right in that context. I think a technical analyst who is that conflicted hasn't got a good method. Then there are the people that Shiller describes, who aren't conflicted at all. They have total conviction all the time, but the conviction switches constantly from bullish to bearish! Sounds like the market itself, doesn't it?

5.12.8 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

RP: Creativity is crucial. A non-creative person can learn to read in another language, but it takes a creative person to decipher a language he's never seen. The market's language is complex, and you have to be creative to discover its hidden regularities. I don't know if it can be learned, but I doubt it, although it can be encouraged.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

RP: Sure there is, just as there is for any other task or craft. I would say that a good technical analyst has a talent for turning data into pictures, and pictures into conclusions.

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

RP: Another yes and no. You can overcome unfavorable traits to a degree and perhaps even succeed. But you can never be at the top of the profession if you have them. If you are skinny, you can't overcome it to be a lineman in football. If you are short, you can't overcome it to be Michael Jordan. You might play a mean game of football or basketball, but you won't be the best. If you are clumsy, you may learn to play the piano but never

[21] De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

like Mozart. If you are a plodding thinker, you might make a great accountant, but you will never make a great technical analyst. If you are comfortable with the behavior of machines but not of people, you might make a great engineer but not a great technician. So pick a profession that suits you.

J: In your opinion, will artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

RP: I don't have a philosophical stance on this question. Computers someday might be able to mimic a talented person. After all, computer programmers can be creative, too. Computers' one big advantage for market analysis is their utter lack of emotion, which gives them a huge edge. Their current – perhaps insurmountable – drawback is that they are not adaptive or creative.

J: Consider the statement "technical analysis is what you want it to be."

RP: Wow, do I hate that statement. The truth is that *fundamental* analysis is what you want it to be. I sometimes demonstrate this by declaring, for example, that as interest rates rise, stocks go up, and people have no trouble explaining it: "Sure, as the economy heats up in a boom, lending go up." Then I tell them I lied, that actually, as interest rates fall, stocks go up, and people say, "Sure, as interest payouts fall, stocks become more attractive to investors." You can "explain" either side of *every* fundamentalist argument! What do you think financial media commentators do all day long? They rationalize market behavior with this nonsense. So anyone who says that technical analysis is open to interpretation has to answer, *compared to what*? And they don't have an answer. And you can't say "science," because until very recently, science has not addressed the task of financial market forecasting except to say it can't be done. Market analysis is in a pre-scientific era, but that's not to say that brilliant work isn't being done; it is. But most people use it to make money, not get tenure. Fundamental analysis is way worse off; it's in a mystical era. People believe it because they believe it.

J: If technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case my statement would become valid. What do you think?

RP: I think the question is improper because it seems to equate facts and performance, which are different. Technical analysis is properly a science of probabilities, and at best right now it's a young science. But whether a person can *predict* markets well is not only a matter of science. The study of facts and the talent to apply facts are different things. Physics is a science, but does that mean anyone can be a great theoretical physicist? No, it requires such sublime thought that it becomes an art. You could determine *scientifically* how to win at chess, but you can't make someone win. You have to be talented to win. You can determine scientifically how to pilot a jet fighter in a dogfight, but only a few people could actually

pull it off. Market analysis is likewise performed in an emotional setting, which complicates matters. I say that performing technical analysis is a *craft*, which requires both science and artistry.

5.12.9 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

RP: The good kind or the bad kind? Well, I would say that, comparatively speaking, it's less than the role of luck in fundamental analysis. Think of all the people in the latter half of the 1990s who said that stocks would go up as long as earnings per share increased each quarter. They utterly disregarded the relationships between the level of earnings and the stock price! It was stupidity at its worst. Yet they appeared correct for *years*. Of course, they never sold at the top because their logic was wrong, but they were lucky for awhile. Then there was the "New Economy" crowd, which looked right for a few years even though their premise was false.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

RP: It depends on the type of astrology you're talking about. To my mind, the traditional kind – reading charts based on a company's date of incorporation, for example – is bogus. On the other hand, there is some physical evidence that phases of the moon alter electrical potentials in plants, and from that possible explanation has developed an area called astro-economics, under which it is asserted that planetary alignments trigger changes in electrical and/or magnetic energy reaching the earth and thereby changes in the mental states of populations. Because it addresses primarily the psychological state of the market irrespective of anything else, it's technical analysis. I don't know of any conclusive studies, but I would encourage testing any plausible idea that might advance our knowledge of market behavior. If the claims are true, then it would be an explanation for why technical analysis works. My own opinion is that mood states are endogenously, not exogenously, formed, but I would be remiss in failing to point out that some astro-economists have consistently excellent records at market forecasting. They're a hundred times better than economists. As one of them likes to say, economics was invented to make astrologers look good.

5.12.10 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

RP: Always. This might be a good time to point out that I have met many technicians who began as practicing fundamentalists and gave up on it, but I have never met someone

who went the other way.

J: Did you become more or less convinced since when you first started?

RP: More. As I said before, I'm a purist now.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

RP: Sure. I would read the weakest study from academia and wonder why it was considered science, and then I would have to endure comments that technical analysis was magical thinking. There is no magical thinking to compare with the Efficient Market Hypothesis. Academics can be lazy. There is a book out by a professor who defines Elliott waves as "a 55-year cycle." Good grief. But when markets go down or sideways, technical analysis becomes popular, so I fully expect academia to embrace it as the current bear market develops. But let's be fair. Technical analysts can be excruciatingly embarrassing to their own profession. I know I've been. Sometimes I get excited about the potential of an idea, so I will apply it as analysis when in fact it is utterly unproved and speculative. When I have to abandon it later, I kick myself for the transgression. It's tough to avoid magical thinking or wishes when you're dealing with something as wild as a financial market. But I get more rigorous as I age.

J: What, in your opinion, is the best proof of the validity of technical analysis?

RP: That some short-term traders make lots of money, month after month, year after year.

J: Did you find that your experience with technical analysis contradicted statements made in books (credible or classic literature)? Did that ever discourage you?

RP: I wasn't discouraged, but I was dismayed, particularly when it led me to the shocking realization that even other technicians don't see markets the way I do. I see them on TV talking about what the Fed chairman is going to say, what the trade deficit numbers are saying, or what the trend of unemployment has been – you know, the *fundamentals* – as if any of them makes a whit of difference as to where the stock market is going. I realized I had to write a book about it, so I have two, in a set called *Socionomics.*

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

RP: No one has developed a set of rules for precisely predicting aggregate human behavior. But there is a set of rules that applies, and it's called the Wave Principle. For example, one rule is that a corrective wave will never take the shape of a motive wave. But this is not the same as buy and sell signals. But please. Does anyone really think that there could be a

set of rules to buy and sell at bottoms and tops? If there were, it would be like driving and everyone could do it, in which case the market wouldn't exist. Every software program tries to create rules, but most programmers are too linear and statistics-bound to create truly applicable rules because what is required is flexible rules, which is almost a contradiction. Look, the market is *alive*, and all one can do is describe the behavior of the beast. There are no hard and fast rules about precisely how your friend Charlie will act. But you can assert some soft rules that will apply probabilistically, and that's what technicians do when assessing the market. And I have to add – again – compared to what? Does fundamental analysis have hard and fast rules? None that I'm aware of.

J: Do you believe that technical analysis works even when applied to data other than the market action data (e.g. the weather data or the river flow data)? Please explain. (In other words, to what extent are technical tools designed to capture some unique features of the market action data (such as, for example, human psychology or the law of supply and demand) that are not present in other kinds of data? To what extent are technical tools simply statistical devices, so that they could potentially work on other kinds of data as well?)

RP: Technical analysis is the analysis of collective human behavior, not wind and water. On a much broader level, it reveals patterns of life forms. I suspect that the number of species through time follows the Wave Principle, although I have limited data. The only technical tools that might be useful with respect to inanimate objects or processes are momentum indicators. But that's probably why they are the least useful in the stock market.

5.12.11 Lifestyle

J: Could you describe your working day?

RP: I sit at my desk all day, usually typing. Then I go home at night and type some more, sometimes on a non-financial project.

J: How many hours each day do you spend practicing your craft?

RP: I run a publishing enterprise, so I'm not a full-time technician. I theorize as much as I apply.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

RP: This is a false dichotomy. I'm stressed because I push myself. Yet I have no uncertainty regarding the validity of technical analysis. Yet again, technical analysis is a matter of probabilities, so once you take a stand, you can't avoid stress, not because it's inherent but because your readers or your clients impose it on you. They want every call to be right and

every trade to be profitable. So they transfer their expectations to you, causing stress for no reason but their misunderstanding. Is a baseball player stressed? Sure, but does that mean he doesn't believe in his approach to hitting if he's batting .380? Now, trading is another matter. If you over-leverage, you invite stress. But that has nothing to do with technical analysis. Fundamentalists trade, too.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[22].

Would you agree with de la Vega? To what extent does your trading control your life?

RP: Yes, but he is quite clear in referring to *speculators*, not market analysts. Heavy or leveraged speculators tend to obsess over their positions. It's also counter-productive. When I invest in something non-leveraged, I never stress over it. I don't care if it goes against me as long as I maintain conviction that the position will prove out. But none of this applies to technical analysis per se.

5.12.12 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

RP: Psychology, sociology and history, no question about it. You can combine all these with what I think is a new field: socionomics. Economics has to be un-learned, so avoid that.

J: What advice would you give to technical analysis students? What is the key to success?

RP: Love what you do.

[22]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

5.13 An Interview with Linda Raschke

5.13.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

LR: I would have to say I traded probably for a good 6 to 8 years before I truly got a handle on technical analysis. My dad was interested in markets, and I remember he always had chart books, and he'd tell me to scroll through couple of thousand stocks and look for stocks just breaking out of a base. I didn't know anything at the time and he didn't either. Then I went to Occidental College, where I got a degree in economic theory. There was a fund called the Charles R. Blyth Fund, which 10 of the students got to trade. Again, I knew nothing about technical analysis, but we were making transactions in the market off of fundamentals.

I later ended up becoming a floor trader on the Pacific Coast Stock Exchange, trading the equity options, which, at the time, was more oriented towards pure arbitrage. However, the person that backed me, took me under his wings, was a technician. And, since this was back in 1981 or 82, we didn't have computers, so we would update the charts by hand. We would also call a hotline at night where we would get an oscillator which was essentially a normalized difference between a 3 period simple moving average and a 10 or a 16 period simple moving average. So you had a momentum oscillator with your bar charts. Then, at the end of the day, I was always taught to keep things like 10 day moving averages, advance declines, put-call ratios, and volume characteristics. So that's how I started very early on, at least that's how I started getting into the routine, and much of the processing of data is a bit of a ritual or a routine.

And, at that time, back in 1982, we were about three blocks away from the San Francisco business library, which at that time had one of the largest selections of books on technical analysis anywhere in the country. So I would go there and read. For example, I remember reading about the chaos theory and about the equivolume charts, where you are plotting the volume relative to the price. I even plotted the equivolume charts for a while. So, I had an exposure to technical analysis since very early on in my trading career. However, being a floor trader, I worked in the bid and the offer a lot, and technical analysis was not a critical element of my trading right away, in terms of analyzing the directional play. In fact, much more of our analysis went into applied volatility and really basic stuff, I think, because we didn't have the computing power. And I would say that it was not until at least 6 or 7 years after I've been on a trading floor, that I felt I really did not understand how to use the tools to forecast the market properly.

I remember when, in the summer of 1987, the market just kept going up and up. It was the middle of July. At that point I had left the trading floor, I was trading from upstairs, and I used to do a lot of index futures and things like that. The market just kept going up and up and up, and I remember having this light bulb go off in my head and thinking, 'I have no clue of what this market is doing, where it is going, or why it is doing what it is doing.'

This is after being a very successful floor trader for 6 or 7 years. Despite all my experience and the reading that I've done in the business library, I just had this total realization that I didn't have the tools or the knowledge to figure out what this market was doing.

I would have to say that I truly did everything the figure-it-out-yourself way. Most of the work I did at first was comprised of really simple bar chart patterns and a two period rate of change, and that 3-10 momentum oscillator that I used to use. I was also watching the movement from a 2- to 3-day time frame perspective, the swings of having 2 to 3 days mark up, 1 to 2 days mark down. I wasn't really getting into intraday charts or anything like that. When I started the research partnership with Steve More in 1993, I got a lot more formalized in my research. At that point I went on a binge, just trying to quantify everything. So that's sort of a long explanation to your answer, but it gives you an idea of the evolution, just how long it took before I felt I got a real handle on technical analysis.

As part of that journey, I remember in 1994 and 1995 trying to model the profile of price behavior using neural networks. I knew this guy whose name was Ernie Baum, whose son was one of the head guys of artificial intelligence over at NASA. The neural networks were pretty complicated at that time, I could just give him the questions to ask, but the actual programming, maintenance, and the training of these things was at least a 10 month effort, a solid 10 month effort. A lot of types of questions I was asking were along the lines of first and second derivatives of different look-back periods, because that was related to what I was doing with the 2 period change and the longer term momentum things. It worked fairly well, I found I would hit these points where neural network would be kicking along, being fairy accurate. I would just ask it a simple question every day. I'd say: on a scale from 1 to 10, or a scale of 5, tell me if the close is going to be up, plus 1,2,3,4,5, or down, minus 1,2,3,4,5. So if you had a plus 4 reading, that would mean that the market had a pretty strong upward bias there. So it's pretty crude, but you can't ask these things very sophisticated questions. But this thing was so good, I'd see floor traders calling me up at my house every day and asking what does the model say. And, of course, there is no money management built into these algorithms at all. But, what would happen is, we would hit these data points where the model would say plus 5 or minus 5, in other words, it would tell you to expect a big move, but it would be totally dead wrong in the direction. At first we tried to figure out what was causing such behavior, but ultimately my conclusion with the neural networks was that they are better as pattern classifiers. You might just as well go modeling on a linear basis or something, and use them as pattern classifiers, as a component of the model. So, you know, you go through this process of investigating everything and getting fancier and fancier, and building everything up, and then ultimately, you start reducing everything back down again. So that's my journey through technical analysis. A big part of my journey was investigating everything, before finally arriving at the conclusion that it is just price, price, and price that matters, and then figuring out what's the best way to quantify the price, is it going to be via a momentum function, or a range function, etc.

J: You mentioned that most of your initial studying you did on your own.

LR: Right, I just had a charting service, and in 1986 I got my first software program, which has evolved quite a bit since then.

J: Did you have a mentor?

LR: No, my mentor was called experience. Experience is the ultimate master, or the best teacher. I remember the first time that I got my charting software, I was the first one that had it, nobody else had it. I had all these little stochastics and moving averages, and this was a big thing back in 1986. Before getting this software, I made money for 48 consecutive weeks, I had 48 winning weeks in a row. Then I got this thing, my first software program, and I lost money for 3 months. I was like a kid in a candy shop, seeing what isn't working, and playing with all these different things. So everything I've learned about technical analysis, about quantifying patterns, was always the hard way, by investigating what didn't work and why. I do a lot of probability modeling. Let's say I have something that says I have a 66 percent success over a sample size of 2000, which is a very nice, reasonable edge. Or let's say I have a pattern that works 80 percent of the time. Then, I am going to try to learn more about why these things didn't work 34 and 20 percent of the time respectively and what the factors are that I could decently model that would set that up. So it's always the investigative and inductive reasoning, where I am considering all the different routes I could go.

J: Is it because you could not rely on the information you found in the literature? Did you perhaps find that your own experience was contradicting what you saw in the literature?

LR: I was an ignoramus. I didn't even know there were books out there. I mean, I was a floor trader and we would laugh at books. Don't you know that people who write the books are the ones who can't trade and don't know anything about the markets anyway? Come on, if you have something that works and it's good, are you going to write a book about it when you can make money off of it? No! Of course, there is basic stuff, like the bar charts that you should know, and that's why in the mid 90's I became a big promoter of classic technical analysis and its forefathers, including Charles Dow, Schabacker, who is the father of chart patterns, and Gann, for his observations about the way the market trades around swing highs or swing lows. I don't do any Fibonacci or weirdo calculations, I don't believe in that stuff. But I respect Wyckoff, for his attempt to organize the way we think about the market by distinguishing among the distribution, the accumulation, and the markup phase. Then there is Elliott. I don't practice the Elliott Wave analysis, but you have to understand that this was the way that these people tried to organize data at the time. They didn't have computers, they didn't have ways of crunching numbers that we do now. So they had to try to put this overwhelming amount of data into some type of framework or structure. It was just their attempt to process it. You had your basic theory that the price behavior was reflection of the crowd dynamics. So, bar chart patterns are a reflection of the crowd dynamics, but then some of these guys tried to take it one step beyond that and say, well, how do I fit this into some macro cycle, maybe a parallel business cycle, a broader

span. That's all they were really trying to do. That's at least what I've seen, and I spend a lot more time on the futures side, which, in my opinion, has been a lot more sophisticated in its research, or has been a subject of a different type of research from what was being done on the equity side. I think that, on the futures side, we did a lot more modeling of stuff that could be readily quantified early on. It's funny because I also keep track through all the classic literature of the evolution of systems. For example, Charles Keltner was a person who in the 50's, I think, did a first system based on the breakout of a range function around a moving average. So he was one of the first to do mechanical systems based on range functions. I like keeping track of that kind of stuff, to me it's like a hobby.

J: How much time did you spend learning technical analysis before you felt prepared to use it in your trading?

LR: I would say that technical analysis came second. Because I was a floor trader, I am very sensitive to price, and intuitively, just from experience, I am very good at tape reading. So I can observe relationships in the market, because that's really what tape reading is about. For example, I can observe how the bonds are trading relative to the S&P's, or if something is making new highs on an increasing volume, or if today's range is bigger than yesterday's range – these are all tape reading functions. So, I've seen all this first, without being able to put a definition to it, because this is what I was trading off of, and I knew from experience when I wanted to be a buyer, when I wanted to be a seller, because I was conditioned that way. But then technical analysis came second to it. It was like, well, let me see if I can define this, let me see if I can quantify what I am trading off of.

5.13.2 Personal style

J: Could you describe your own distinct style of technical analysis?

LR: I am pretty much 100 percent price based. I don't use volume, because most of the work I do is on the futures side, and it's difficult for me to get timely volume data. I have also found that the volume is pretty highly correlated with the range, so that if I have a contraction in the range, I am going to have contraction in the volume, unless it's at a certain point in the structure. So, I will look at volume characteristics intraday, for buy climax or sell climax type of thing. I do use volume as a confirming factor if there is a good trend move. In the analysis that I do every night, it's pretty much all price based. I rely on momentum functions and spend a lot of time on volatility indicators.

J: How much of what you learn from others do you directly apply in your trading?

LR: Zero.

J: How do you learn what works for you and what does not, without making big loses?

LR: Well, you try it out on small sizes first. You can come up with a strategy that's great on paper, but it might not be executable. People tend to do all this modeling, but they forget about the liquidity factors, and that's as big a part of an equation as doing the actual analysis. So, you always have to try it out small to see the mechanics, to get an idea of how much slippage or friction there is. Then I have to see at what level of efficiency I can trade that model. Is it something that can be automated, or does it take human monitoring on an intensive basis which might cause me to miss signals, how much room is there for air – all these things become factors.

J: Is your analysis more effective when you are working by yourself or when you are working with others?

LR: I sit down every night and basically do my homework on 25 different futures markets. I do the currencies, the bonds, the index futures, metals and grains and other stuff, and so I just go through one market at the time, and I pretty much use the same tools on all of them. They all have their own subtle nuances, and some markets have more noise than others, but I am basically looking for 2 or 3 main patterns on each of them. Then, usually on the weekends, I'll go through and I'll do broader analysis on the stocks. But I have a methodology, a routine that I follow, so it's very much like a ritual, I don't really think about it. I always have to do my analysis when the markets are closed, in terms of preparation for what I am looking for. It's like taking a test with a number 2 led pencil – your first guess is always going to be your best one.

J: So it's mostly just you, you are not really working with other people.

LR: I can't, no, unless something needs to be automated, in which case I might have another person help me with the modeling or with the research. And if we are developing a model, I have no problem letting the model trade on a mechanical basis. And I have no problem with having other people function as triggers or alerts – I'd tell them to let me know if this and this happens, or things like that. But if it's anything that involves any level of subjectivity whatsoever, I don't trust anyone but myself. Because if you have any level of subjectivity whatsoever, even if it's one percent, I am the only one who can tell them when it's not working, when what I am looking for isn't happening.

J: In what kind of market conditions do you make most mistakes?

LR: I will tend to make more mistakes when I haven't had enough sleep. Honestly, I spend a lot of time making sure that I eliminate stress from my life, that I eat right, that I exercise right, because what I am doing isn't 100 percent automated or mechanical. I mean, there is a big connection between the body and the brain. So, I'll make my mistakes when

I am tired or burned out. In terms of market conditions, I don't ever look at it that I am making a mistake because of a market condition or a market environment. I am always making my best educated guess as to what the probability models are telling me to do. And there is always going to be a percentage of time that the trade does not work out. It's not because I've made a mistake, it's because those are the numbers. I know I am going to lose a certain percentage of time. I know not to overtrade when there are high levels of noise, and I know the types of conditions that lead to very noisy markets. I know that, if I am trading in a noisy market, I need to trade a different type of style; for example, I am going to trade lower leverage, and I can do more aggressive counter trades. I would say, as a trader, that one of the more frustrating environment to trade in is a very low volatility environment, because you don't have the swings there, and there are just not as many setups that occur. When you have low volatility, that often means that you have a strong trend, because a characteristic of some of the strongest trends is declining volatility. And what that's really telling me is to jump out of my time frame, because at that point I can't be as accurate in trading the intraday swings. I need to just be an investor at that point, just to position myself and just stay with the trend, and that's probably the hardest thing for me to do, because I enjoy trading, it's fun. So a strongly trending market, where you need to be able to just put a position on and walk away, is frustrating, but it isn't a type of market where you could say you are making a mistake in, unless your mistake is too early getting out of a position that is hard to reestablish.

J: Which mistake did you learn the most from? Do you recall it?

LR: Oh, absolutely. I'll tell you, my biggest mistake is trying to guess a directional outcome from a low volatility point, trying to guess a break out. It's a very seductive little game, but if I have a 50-50 bet, I am going to be wrong 90 percent of the time – it's like Murphy's law. That's why I did so much work on volatility filters. It's like, I am going to quantify this, so I know not to trade at these points.

J: How much of what you do are you willing to share with others?

LR: I am willing to share anything, as long as it's something that can't be 100 percent automated. I am not going to share anything that somebody could take and use the specifics to go run a half a billion dollars. It would be pretty stupid to do that – I've come up with those things myself to get my own fund back up and going.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

LR: I would say that you always have two functions that are going to be attributable to your long term success. The first one is trying to manage the risk, that's more important than anything. What's going to be your strategy for managing the risk? And the second

one is leverage. At what points in the market, in the market environment, or in the overall structure are you going to use bigger leverage? That's a very key part of money management, because you get certain points, and you have to make those big wins count. Or, at what points you are going to have to cut back on your leverage, again due to either liquidity conditions or a different type of market environment, whatever it may be. So, the two functions are, (a) the money management, and (b) the use of leverage that you are doing. And then, you have to ask yourself how you are playing your exit strategy. Whether you are playing for a small target or for a larger target has a lot to do with it. I would say maybe 80 percent of the time you are playing for a small target. It's really a low percent of the time you are playing for a big target. So, it's a mixture of those factors.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

LR: I always use two timeframes, first off. And, if you step out to a higher time frame, you are going to overcome that noise. The markets just have a noise factor – that's inevitable. In a strong trend, you are not going to have the noise. Perry Kaufman did a lot of nice work with the efficiency ratio there. So, in a strong trend, you are not going to have the noise. In a more of a trading range you'll get an increase in noise, and if you go down to a lower time frame, you'll get a higher increase in noise. So, the noise is a function of the liquidity of the market you are trading, of the swings that it has. I've made my living on noise, trading off of the bid and the ask. Noise is not a bad thing, let me tell you. It's a good thing. If we didn't have the noise, we wouldn't have the opportunity. That's how I look at it, noise is a good thing!

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

LR: Well, I am purist. I don't do any fundamentals at all. I mean, I'll look at liquidity or monetary measurements, such as money flows, money supply, and stuff like that, but I don't know if I would put that into a category of fundamental analysis. You start opening a whole can of worms. You start asking, what are the weightings of the market, what are the traders' reports saying, are commercials or the funds too long or too short on one side, what are the sentiment readings, and you enter into a more nebulous area. I don't do any research along those lines. I mean, I'll look at them just because I want to be aware of them, but I would say that in the long run, they'll do me more harm than good. Sometimes the best moves happen when nobody can figure out why, so I am just purely interested in basic supply and demand, and in the balance that's there. I don't care why the market is doing what it's doing. And I am the worst at creating scenarios. If I were trying to figure out what would happen if the currency were to do this or to do that, it would affect my ability just to process information that I see. I don't watch TV, I make sure I don't read newspapers, I don't want anybody else's advisory letters, I don't want to know what anybody else thinks.

I will work best in a total vacuum.

J: How much of your technical analysis is done on an intuitive and subconscious level?

LR: I think intuition is just the sum of experience. Honestly, I am really bad with words. I can score really high on my math, but when it comes to my verbal skills, there is something that just doesn't quite work up there. So, maybe you know something, but you can't put it into words or define it. You can do the same with mathematics, you have to jump to certain conclusions almost with an intuitiveness. Not being able to put words to it, but being able to have a conceptual model in your head that's more abstract, is not necessarily a bad thing.

5.13.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

LR: The most useful ones are the momentum functions, there is no doubt about that. I am looking for something to tell me that there is a supply and demand imbalance, period. And I want to trade in that direction, because that's what created the edge. So I am looking for anything that measures that there is an impulse, momentum, or range extension, and I try to put that in a structure that supports that framework. What are the least useful indicators? I don't know. An indicator is a pretty broad, vague word. For me, indicators are anything that I can quantify. So I have to be able to run an indicator on multiple markets and multiple timeframes, whatever, and still see a similar profile in the results that I get, and in the tendencies that I get. If you've been up for two days, what are the odds that the next day is going to be down, or if you have two days that trade from low to high, what are the odds that the next day is going to trade from low to high – I don't know if you would call these indicators, but those are the types of things I look at. I don't ever look at anything like on balance volume, etc. I like looking at an ADX, that's an easy way for the eye to see that you've had a lot of price bar overlap, in other words, consolidation, accumulation, or distribution, and that the market has wound down to an equilibrium point. When the market winds down to an equilibrium point and then it gets out of line again, you have a supply imbalance or demand imbalance, and the market moves to the new level. And then it has to do the testing back and forth, until it winds down to an equilibrium point again. This is the model that I use for everything. Market makes a move, it has its initial check-back, and then it has to go though the testing process, to see if that's definitely a new level that it's going to stay at, and at some point it comes back into an equilibrium at a new level. At that point you see the ranges contract, you see the volume and the volatility contract, everybody is happy, but then when the market moves out of that level, you are either going to have the buyers on the wrong side, or the sellers on the wrong side. Then you hit these short term positive feedback loops, where you have new buyers coming in, and you also have stops being triggered, etc., where new buying attracts even more buying. I would say that 75 percent of the time, the market is sort of alternating between these negative feedback

reactions – checking and testing – until it winds back down to an equilibrium point, at which point you can get positive feedback, where you can get acceleration in the movement, and then the whole game starts over again. That's 100 percent of the model that I use. It's pure price, there is no volume, there is no relative strength, there is no sentiment, there is nothing but price.

J: Do you also look at classic chart patterns, such as head and shoulders, inverse head and shoulders, triangles, rectangles broadening tops, bottoms, etc.?

LR: I do, but I look at them in a different way. If you sat there and looked for a classic head and shoulders pattern, which is probably my least favorite out there, you could take a ruler and draw a sideways line, and you would see that it goes through numerous price bars. So really you have a long sideways line – they use that term in point and figure charts – where you had the price trading at the same level numerous times, back and forth around that level, maybe it's a little higher on the head part, but the price fluctuated around the central value for a long period of time. That could show up as a head and shoulders, a rectangle, or a wedge. So eventually, that right shoulder will end up at an equilibrium level on my data, my indicators are going to show that contraction in volatility and that loss of momentum, at which point you'll eventually have a breakout form a chart formation. The main difference between the two types of patterns is that the reversal patterns tend to be much longer, take longer to unfold than continuation patterns, which are short and quick. Probably, continuation patterns offer best risk-award ratio for a trader.

J: How do you test patterns or indicators before you start using them in real trading? Do you ever ask for other people's opinion when you are making such decisions?

LR: The way I use indicators is very broad. For instance, I might use a pattern recognition algorithm off of a two period rate of change, which is a little superior to just a simple one period rate of change. Here we are back to the notion of the signal to noise ratio. So I'll use that to give me my bias. I'll say, OK, I know today has 80 percent chance that it's going to trade from low to high, and a certain percent chance that it's going to close up. So, it will just give me a bias. Then, really, in terms of framing out the trade, I use basic price structure – I ask myself, am I going to try to buy a test of the support area, am I going to put a buy stop if it takes out this certain level, how am I going to frame out that bias in terms of risk and reward, how am I going to know where to put my risk point. So, in terms of framing out the actual trade, it's always going to be off of price, off of the short term support and resistance level, or off of some price function that's going to pull me into the trade if the price moves out of a certain level.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

LR: Well, I think that many people would select momentum indicators as their number one choice indicators – it would be some type of oscillator, it doesn't matter if it's a stochastic or a moving average oscillator. But you have to understand that a directional indicator like that is going to work best in a normal trading market. It's not going to work in a very low volatility environment, where there are no swings to measure. And it is not going to work in an extremely high volatility environment, unless you still have a trend intact, in which case it will work very well, in terms of the momentum function preceding price, and when momentum precedes price, that's probably your strongest edge in the market. But after you've had a buy climax or a sell climax, if you are using the directional indicators, the first signal will be a false one. For example, you don't want to make the mistake of buying the pull back after a buy climax. Or, in a sell climax, where you have a sharp spike down and a sharp reaction up, you get at least a spike reversal – it's the highest volatility that you've had in the market. Any directional oscillator is going to fail you at that point.

J: Is the number of indicators you follow greater when you are more cautious than when you are less cautious?

LR: I try to keep it really simple. I do better with fewer as opposed to more. I'll look at two or three time frames at once – that's important, because first I always have to know the overall structure, and then the lower time frames help me frame out the trade. I'll always use the momentum function just to confirm what I see in the price action. And I'll use a volatility indicator, just because it's a crutch, it helps you readily see what's there in a bar chart anyway. So I'll flip through a 100 charts, and if I use an indicator I am able to scan the charts on a more timely basis than if I had to look at each bar chart and process it myself. Most of these types of indicators are just a derivative of price, so, you know, after you've seen them a million times, you see the same things in the bar charts anyway.

J: When you are dealing with larger amounts of money, do you find yourself being more cautious?

LR: That never comes into play at all, because I reduce everything down to a unit size, so I trade only one unit, it doesn't matter if it's on a 100 thousand dollars or on a 100 million dollars. I have one unit, it may be one contract. As my trading capital increases, my unit size increases, I just have to make sure that the unit size is appropriate for the level of liquidity in the markets.

5.13.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

LR: You know what? I have no idea. I have no idea because I really don't see what other people are doing so much, honestly. I noticed a proliferation of books in the last 7 or 8 years,

but I don't read any of them. I think a lot of them are written for marketing purposes, I haven't seen very much good published research. I thought that stuff like Ashkanasy's book, *What really works on Wall Street*, (I think it came out in the mid-90's), was a nice study, an examination of the different strategies out there. Whether it's right or wrong and how thorough it is, is a totally different issue. That's the type of book that might have value to me because at least it's backed up by some numbers. Perry Kaufman wrote some excellent books, and at least he has quantifiable data behind it, whether you agree with his thesis or not is a different story, but at least he presented it in a good format. So I would just say that technical analysis has seen a proliferation of a lot more junk out there. I mean, what can you say about it? There is nothing new to say about it – you are testing a previous high or a low, you are buying a retracement and a trend, or you are following a breakout strategy. It's really, really simple, there isn't really anything new that you can say that hasn't been written about a hundred years ago. That's where the whole joke is. If you want to be successful, it's all about risk, the money management, and the leverage. At least now we have computers, so it's easier to crunch numbers and calculate probabilities.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions?

LR: I don't know. What are the new indicators, what new else is there out there? I guess people can examine little nuances differently, maybe in terms of volume or in terms of segmentation of certain sectors. You can do a lot on the equity side with the relative strength and the sectors. Everything is a relationship – there are yield curves, relationships between the indices, relationships between the small caps and the big caps, or relationships between volume and price – but I just don't think that there is anything new out there, I really don't.

J: To what extent has the introduction of the variety of computer software aided the craft?

LR: Oh, it speeded it up a lot, definitely. Everybody is looking at the same levels, everybody is looking at the same points. People are getting very good at technical analysis, and you've got very smart money out there. A lot of it has been automated now. You've got market maker functions that are totally automated, with which you can work the spread between the bid and the ask, thousand times, all day long. And you've got longer-term trend-following systems automated. I would just say that information processing is done a lot more quickly, and a lot of times the window of opportunity is not as big as it used to be.

J: What are the advantages and disadvantages of relying on computer generated signals?

LR: I do a lot of systems and a lot of modeling, and I use systems as an indicator. The big thing is, you have to know what environments to turn them off in. If I am in a certain type of market environment, I know I am not going to follow a certain system. The only types of systems that I would ever dream of doing on a 100 percent mechanical basis would

be strictly range based systems, volatility breakout type stuff, some filters – that's about it.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

LR: Well, I think that if you really want to get an understanding of the markets and of the price behavior, then there is no better way to do it than by doing stuff by hand. Absolutely, 100 percent, you will process information differently if you are writing stuff down than if you are looking at the screen. And that's why at night I make it a point to write things down – I'll show you my book of all my numbers that I write down. They're on the computer. I can pull a page and they are all right there. But if I write them down, it goes to a different part of my brain, I do get a different feel. It may not be drawing bar charts by hand. For example, I always used to either take hourly readings, or, when I first left the trading floor in the mid 80's, every 5 minutes I would write down the ticks, the trend, the volume, and the price. So I process data numerically instead of in a picture. I write down hourly readings or levels, swing highs and swing lows. Processing the data numerically works better for me than looking a pretty bar chart.

5.13.5 The innovative process

J: What drives your innovative process?

LR: Loosing money. Any time I get caught on something, I am frustrated, or can't figure something out, I think about how I can be on the right side of that the next time.

J: Do you and to what extent collaborate with others during the innovative process?

LR: Only to help me do the grunt work. For a long time, I'll sit there and I'll test data by hand. Or, I'll have somebody go through each data point, one by one, and write down things that I want.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

LR: It's not that the indicators are insufficient, and I think it's a mistake to say that there are new tools. I think it's more the matter of what type of framework do you put the data into, how do you organize the data and what type of structure do you put it into, as opposed to what particular tool or indicator do you use. For example, I could say that if I am looking at this particular data, I need to look at it in the context of a daily chart, a weekly chart, or a broader structure, and see how that's going to change the picture. It's not going to need a new tool, and the indicator is always going to be the price and the momentum type of stuff. I

would say that the indicators with which I feel most comfortable are all range based functions.

J: How soon after you develop a particular technical tool do you make it accessible to public?

LR: Well, I have an online service where I put in my trading activity during the day. And I am always encouraging people to do the research, always, always, because it's such an investigative part of the process. I don't publish anything, the only thing that I've ever published was a book that was written some 7 or 8 years ago, that gave just some basic tendency type stuff. It wasn't meant to be a mechanical system or anything. I am not a research service, I am not out there selling research. I am a trader, and if I find something that has a good edge that could be turned into a mechanical system, I am not going to publish that. But there are a lot of things that I share with my client base, such as some of the changes that we've noticed in the daily tendencies, or I tell them if it's better to use a range based function, a price based function, or a time based function. Which is better, using price or time, if I am looking to do a breakout? In other words, do I want to take a breakout at a certain time period, or do I want to take a breakout at a certain price function, a range expansion? So that's something that I'll share with my clients, because that points them in the right direction to develop their own models.

J: Are there things that you developed, but never shared?

LR: Honestly, I've shared everything that I've ever come up with, but that doesn't mean anything. You still have to figure out the risk, how are you going to manage that risk, where are you going to get in, and where are you going to get out. An indicator is meaningless. It's an indicator, it indicates something. And that's a whole lot different from knowing how to trade and manage the emotions and all that kind of stuff. So, I don't mind sharing any indicator that I've come up with.

J: How often do you use the technical tools you developed?

LR: Every day, every minute. I am looking at the same thing every time. I really feel if you find something and it ain't broke, don't fix it! What I do now is pretty much the same thing I've done all along. And all the other stuff that I do, all this fun stuff is just mental gymnastics, part of the investigative process. I am always curious, I am going to test and examine everything out there. Does it mean it's going to work for me? Not necessarily. It may not be executable with my resources.

5.13.6 Emotional aspects of the craft

J: Has a big loss ever made you doubt the validity of technical analysis?

LR: No, because technical analysis tells you where your risk point is. That's what technical analysis is – it's defining by the technicals where support and resistance are, and how tight you are going to play that. My big losses come from the stupidity of myself, not from the technicals failing. There is no such thing as a technical tool that works a 100 percent of the time. You can't sit there and curse yourself because you are an insurance company and a hurricane hit. The market has risk. You have to say, what is the overnight risk, what is the risk that the plane flies into a world trade center, what is the risk that the president gets shot. These kinds of things are probably not going to change the underlying technicals, but they can cause large adverse moves. Technical analysis is not going to prevent that kind of risk.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

LR: I am very good about controlling my emotions. I've got a really thick skin. That's because I had a really big loss very early on, when I first started trading, that very first year. And nothing can ever be as bad as that big first loss. And now it's like, I don't care. I would say that the bigger problem for me is making sure that I am not tired, that I am well rested – that's a far bigger problem than my emotions.

J: How did you feel when you first lost a lot of money?

LR: It's funny, because it was sort of like, the damage was done. It was just very depressing. I knew it was going to take a long time to make back up the money. I thought, OK, I am a slave for the next three years, I am an indentured servant for the next three years to pay back my losses. So you really try not to think about it, you just take one day at a time. That's what I always try to do, just take one day at a time. It's funny, it's like the older you get the more you know that you just don't know anything. I just go in under the assumption that I just don't know anything.

J: Has it become easier to lose as you became more experienced?

LR: Again, it's not hard losing, it's not hard losing at all when you know that you playing the game where you are the house. I don't care if I lose if I am playing by the rules because I know I am the house. I know that what I do has a good edge, it's worked for 20 years, it's not going to change. I can always make money with it. What's harder is, if I know I've made an error and I don't fix the error on a timely basis. That's what's hard, because then what can you do, what can you say. It's like, I was stupid, I had an error, I didn't fix the error, I didn't correct my mistake immediately when I know I should have. It's like you've been on a diet, and then you go to a wedding and eat a chocolate cake. What can you do? The damage is done, you've got to start on the diet again the next day. It's the same thing with trading. It's probably the same thing with professional sports. A player can make a

mistake on the tennis court that costs him the game. Maybe he does something really dumb – he chokes and looses Wimbledon. But you are a professional athlete, you just go back and play a better game the next day.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

LR: I think there are some people who will never be able to do it just because they are more emotional people. I think some people can be very good at the technicals, but when they get real money involved, it does different things to their head or psyche. I've seen people who are naturally very good at trading and managing risk, and they don't know anything about the technicals.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[23]." To what extent is this statement true in your case?

LR: When I am trading well, or when I am operating normally, I am not tired or anything like that, it doesn't come into play at all, because I am just executing my plan that I wrote out the night before. I say, OK, I am going to be a buyer if it starts trading above this level, and a buyer if it starts trading above that level. I try to immerse myself into a lot of routines and rituals, to turn the brain off. I try not to think during the day. That's why I'll sit down at night, and write down my numbers, and crunch out the numbers, and do my research. I'll keep myself doing all this busy grunt work and everything. It's probably useless to see all these volumes and volumes of research. Am I trading any systems off of it? No. But it's just a way of shutting down that voice inside my head. So you just do something over and over until it becomes automatic. You can't have a guy who is about to throw the pitch in a world series sitting on the pitching mound and saying: 'Well, let's see, I threw it to the inside right hand corner the last time, maybe this time I should throw it to the other left hand side one, but wait, maybe I don't want to do that, because this guy is left handed.' A pitcher can't do that. His catcher says throw here, he winds up, does his best motions, and gives it his best shot. That's what I do as trader. Instead of having a catcher there telling me what to do, I have my 2 period rate of change telling me if I want to be a buyer or a seller on the day, and, when I see my spot, I wind up and give it my best shot. And the more I can keep the little voice out of my head, the better – then I am just out there going through the motions, really.

[23]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

5.13.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

LR: First of all, everybody has a different way of processing data. Some people are very good at processing data just by looking at the numbers, quantifying things. Other people are very good at processing data from the visuals, like bar charts. I had one fellow that worked for me who loved reading the *Wall Street Journal* and all these stories. Somehow that stuff messes me up, but that was his way of processing data. I mean we're all created equal because we are human, but ultimately, in the market place, you have to find something that's going to work for you. And that's where you have to be creative. It's a willingness to be independent, a willingness to do your own analysis, have your own thoughts, and develop your own model. And if you don't do that, it's not that you are not creative, it's just that you are lazy. I am sorry, you are lazy, you just don't want to work. But everybody, even the most boring mathematician/engineer, can be creative with coming up with some model that works for him.

J: Is there such a thing as "talent for technical analysis"?

LR: Absolutely. I have this fellow who works for me now, who's got an amazing eye for the bar charts. He doesn't trade, he just does the technicals. He doesn't look at indicators, he doesn't do the research, he doesn't do anything except look at bar charts in several different time frames. And this guy is amazing. He never went to college, he never went to school, he had a construction company for a while in New York, made a million dollars by the time he was 26, and lost a million dollars getting overleveraged. So he is definitely an independent type of person, and he just has a gift for looking at the bar chart. Call it intuition or whatever, but the bar chart will speak to him. And what people are saying when they talk about bar charts or the technicals speaking to them is that they are really getting a feel for if there is a supply-demand imbalance to the chart, if there is momentum, etc. – all these things are going to show up in the visuals.

J: Could you define this talent for technical analysis a bit more generally?

LR: I would just simply say that it's being able to take the ego out of it and follow the market, rather than trying to think that you know better or that you can forecast something. It's really the ability to stand here and now and follow what the market is telling you. That's what it is to me. Some people can't do that because they will try to force stuff. But there are very clear obvious patterns that jump right out at you. I don't know if you've ever seen one of those books where there are a zillion little T-cups in a picture which looks very cluttered up and abstract from close by, but which, if you squint and hold it way back, reveals a particular shadow or shade. Some people look too hard at every little detail and the minutia, and they are missing the big picture. Some people just have a gift to step back and say: 'Is there a pattern, is there not?'

J: What personal traits characterize a highly successful trader?

LR: First of all, confidence. You have to be confident in your own analysis, you have to believe in your own work, you have to believe in the model that you are trading. And, second of all, independent thinking. You have to do the research or the background that supports the model that you are using. You have to be independent – you can't be listening to what the consensus is, or may or may not be, or what this person says, or that person says, or allow doubts in. You have to be an independent thinker. So confidence and independence are two important traits. I also think it takes patience. It takes a lot of patience. You have to be willing to sit back and wait a long, long time and be very patient, and understand that that's the nature of the game.

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

LR: Absolutely, but it's more a matter of finding a style or methodology that's suitable for that person's temperament. For example, I could mentor somebody if they were sitting next to me to learn to trade a basic trend following system. I'd say, 'these are the numbers, look for this pattern, when it takes a high, you're going to buy, this is how to manage the risk,' and something like that. So you could teach somebody to do all the mechanics, but, ultimately, they would fail if they got bored or if they didn't believe in it. I think Richard Dennis sort of did that too to a pretty good degree. His odds of success with a group of I think over 20 individuals were pretty high. But I think he took the individuals that had the bent for the numbers in the first place. If you have somebody who is psychologically messed up because they feel that the world owes them something, that's not going to work. With some people there is no way, you could never teach them anything about the market in that respect.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

LR: Well, I think the art part comes down to which relationships you chose to focus on. For example, if you are analyzing the stock market, the art part is going to come from the experience in knowing that you need to look at the relationships between the small caps or different sectors, or perhaps look at the global markets, macro money flows, seasonal tendencies, or different things along those lines. You can't put all these variables into a mechanical model, there is just so many different relationships out there that can affect the price.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst?

LR: I don't think so, again, because I don't think you have a large enough sample size to train it on for all the different relationships of variables. For example, you could look at the 70's, which was a totally different type of economic environment than the 80's, where we saw that bonds and equities were highly correlated. Then, all of a sudden in the 90's, where you got the deflationary fears, the model flipped to inverse. And I don't think that artificial intelligence can recognize as quickly when the relationship is changing, as a sophisticated analyst or a trader can. That's what makes a trader or an analyst exceptionally good – they have the ability to recognize when a relationship is changing faster than the models. And probably one of the more important things in the market that would be hard to quantify is when a relationship starts trading beyond its historical norm. It could be implied volatility, it could be yield curve, it could be PE ratios, it could be any type of relationship. So when you see a relationship deviate from its norm, make new highs or new lows, that's the market telling you a very powerful piece of information. And you can't train an artificial intelligence based model to recognize that because it does not have any experience in dealing with that in the past. And, again, you have this little problem called sample size out there. You just don't have a large enough sample size of these occurrences to train anything that is going to have a high enough confidence factor.

5.13.8 Luck, astrology, etc.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

LR: No, not at all. I personally don't consider astrology to be part of technical analysis. I guess you can measure things like an increase in the ion activity, see if there are solar flares, and maybe you'll have a corresponding increase in volatility, because people are all wild and edgy. I don't know, maybe there is some validity to that. I don't think that people consider astrology as part of technical analysis, and, if anything, it's an amusement factor. If it makes you watch the market a little bit more closely around a certain window of time, what's the harm then?

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

LR: I don't believe in any of them, I don't subscribe to any of them. They might be tools – for example, the Fibonacci numbers might be a tool in tape reading which tells you to watch when the price action reaches a certain number relative to another number. Is there any statistical significance to it? Zero. In my opinion, there is zero statistical significance to that stuff.

J: What is the role of luck in technical analysis?

LR: Luck is the residue of effort. That's what luck is.

5.13.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

LR: There is nothing truer than price. Price is everything, and, to me, technicals are the price. I just don't think that you can find anything truer than the price.

J: Did you become more or less convinced since when you first started?

LR: It works as it always has worked. There are times when it works, and there are times when it doesn't work, in terms of your ability to forecast the price. You just need to recognize that everything is the matter of probabilities. And everything can be quantified, there is a probability associated with every data point. I can ask, 'OK, with three up days in a row, what is the probability that the next day is going to be down?' There might or there might not be any edge to that. So, in terms of my conviction about the validity of technical analysis, I don't think anything has changed at all.

J: Which special moments of your career have been critical in determining your level of conviction and confidence in technical analysis?

LR: For me, it's always easier to use technical analysis on a shorter time frame than on a higher time frame. In other words, I feel that my forecasting models have a very strong edge over the next 24 to 48 hours. If I try and look too far out, one month, two months, three months down the road, it drops way off. So I've got a really strong edge if I am just looking two days out, and I just keep it at that. Nothing has changed, everything works the same way it always has. I think that my confidence level is the same as it always was, I just kind of go and do my same thing every day. And it's not dumb luck, there are only a very few things that work out there. You can really reduce everything down to the fact that you are trying to enter into a trending market, in the direction of the trend. Or, if you start hitting more of a trading range environment, where you're testing, you can make countertrend trades off of a test, or you are going to be setting up some kind of a breakout function. It really comes down to that same thing. I could just say that my confidence in the technicals and the price never changes. But I am always trying to be more on guard about the weaknesses of my game, in recognizing when there are going to be distractions, or where there could be execution problems, liquidity issues, or weaknesses in terms of mechanics – those are some things where I have my doubts.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

LR: What do I care about what the academics think? This is a bottom line business. You think the guys sitting there with billion dollars offshore care if the academics give them recognition? The guys at the Renaissance Medallion Fund are laughing all the way to the bank. I would rather not have this published by the academics, I'd rather not have this taught at universities and colleges. I am sorry, but I could sum up technical analysis in an hour, and you want to build a whole course off of this? I guess you could get more into things like money flows or sentiment data, but in terms of analyzing price, quantifying retracements, and learning what constitutes momentum, it's all very simple.

J: Did you find that your experience with technical analysis contradicted statements made in books?

LR: I think probably some of the best writings on technical analysis that hold up to this day were written by Schabacker, who is the grandfather of kind of a science of technical analysis. He tried to write his observations on the way price trades around gaps, trends, chart patterns, all this kind of stuff. But he also recognized the human element of it. For example, you can make a lot of money in trends, but the human element is going to keep most people from having the patience to stay on that type of time frame. So, even though he was trying to write about the science of technical analysis, he wrote about all the little human elements that are going to try and trip you up or get in your way. He also wrote about the tradeoff between more active short term trading, which is a lot more labor intensive – it takes a lot more time, work, homework, energy, and set up – and longer term trading, where you need to step out to a longer time frame, which most people won't have the temperament to do.

Other than Perry Kaufman's studies which I mentioned before, or some of the studies on relative strength, I can't really think of any books that have really added a whole lot of value in the last number of years. Again, I am sorry, I am a cynic, most of the books are garbage, they really are, because they don't test anything, and they are all just doing this little fallacy of 'cut you losses short, let your profits run.' But I don't think that people who write these books are really trading, and I don't think they test this stuff. They are doing it in a perfect world, but real life doesn't work that way, so I think their work does a disservice. If you go back, pick a couple of pretty patterns, and say 'look what happened here,' that doesn't mean anything, because the odds of that occurring are maybe 1 out of every 50, and the other 49 times is going the be noise, false stuff, chop, and who knows what.

I like the books that have been written by traders that aren't so much about the technicals, but about the perspective of just taking the market one day at the time. For example there is a book called *Taylor Trading Technique*, written by George Douglas Taylor in the 1950's. He was a grain trader in the pits. He shows how he does his technicals in there, how he measures the relationship between today's high and the previous day's low, the relationship between yesterday's high and today's low, and various other relationships which he used

to calculate by hand every day. And then his approach is just taking it one day at a time – are we going to have a buy day today, or are we going to look to be short today, are we in a markup period, and so on. I read that type of stuff to reinforce for me the importance of always following my own work, my own roadmap, and taking one day at a time. If the market gives you a lot, great, if the market only gives you a little, you take what it is. If the trade doesn't work out, you get out, and you try again the next day. That type of stuff I like to read.

J: Did you find that your own experiences have contradicted statements made in the books written by prominent technicians, whom you value and respect?

LR: Gann, for example, is a nice controversial figure, because everyone likes to latch onto all these little goofy circles and squares he did later on. But most of Gann's original writings are on the way the price would trade around the previous swing high or the previous swing low, looking for 50 percent retracements, or something like that. He's not coming out and saying, 'this works 80 percent of the time, buy here, put a stop here.' He is not coming out and saying that. He is saying, 'watch to see if the price retraces 50 percent.' That's not contradicting anything, it's just giving you a level to look at. It's telling you to go back and see what was the previous year's high or low. So, what he's writing about is pretty objective. If somebody is making an observation about the importance of the previous highs and lows in the markets, I would never contradict that. That's totally important. They are the most visible chart points, keeping in mind that it's the dynamics of crowd behavior relative to price that leads to trading opportunities.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

LR: I prove theories every day on my bottom line. My theories work. I think there are theories, and I think they work and they are proven. I can prove that momentum tends to precede price. That's a given. I can prove that. There is a statistical edge there. I think the Fed came out and did a research paper 6 or 7 years ago on the validity of a chart formation. I don't remember what it is, it was about the head and shoulders pattern, I've got that on my website. But, I mean, the Fed is coming out, doing research, telling you there is validity to this. If you take a performance of a trend-following system over the last 15 years, it will have a positive expectation. If you go to any 7 window look back period, take any 7 years of data, you are going to have positive expectation there if you do it across the basket of, say, 12 markets. So, it's absolutely proven, otherwise some of these larger funds wouldn't be in business.

J: What, in your opinion, is the best proof of the validity of technical analysis?

LR: What would be the best proof of it? I am not sure what you mean by the best proof. I mean, if I crunch my numbers, I always try to have a sample size that's well into

the three digits. Or, let's take the Renaissance Medallion Fund, a nice offshore hedge fund. I think it was started by 5 guys out in Berkeley, all PhD's in math. It's 100 percent mechanical, there is no human guessing and decision making involved, and, on between 500 million and a billion dollars, they've achieved a 40-60 percent return a year. What more proof do you need? I think that anybody who demands proof is silly. It's sour grapes. They just couldn't figure out how to execute it themselves, that's all. But I don't want to sound flippant on this stuff either. I think what's most important is to recognize that there is an edge. It's a very small edge, and that edge can easily be lost through friction, the execution, the commissions, and things like that. So there is definitely an edge, and the people who have been able to harness that edge and do it in a really good way of managing the risk have extremely sophisticated set ups. They are working a thousand different patterns, 24 hours, around the clock, around 50 markets, etc., etc. There is an edge, it just may not be as great as people would hope or would wish. And, again, maybe a human can take that edge and know a little bit better under which conditions to exploit it than a mechanical program could know. Humans are going to do that through the use of leverage, knowing when to use more leverage and recognizing in which environments not to trade a particular system or indicator.

J: Do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

LR: Well, interestingly, a friend of mine had a random number generator, and he was running moving averages and range functions off of the data that was generated by this random number generator. You can definitely see trends in the data that is generated randomly, and you can definitely put the models on there which will be able to pull out a small edge. There is definitely a way to get a small edge off of randomly generated data. In other words, there are ways you can capture the noise. But, I wouldn't say what you are doing there are the technicals. I think the word is not technicals, I think it's more statistical studies. So the question is how do you want to draw the line between technicals versus statistics.

J: Are the technical indicators capturing some force that's governing the markets, like the law of supply and demand or the human nature, so that, if we would apply these indicators to data other than the market action data, they wouldn't work? Or, is it the case that these technical indicators are just measuring tools that can be used to predict a future move on any kind of time series data (e.g. the weather data)?

LR: I don't like the word 'predicting,' because I think that they would have a very limited forecasting value. But I think that they could be used to define risk points, if you will, or define certain conditions, maybe classify a pattern. Again, I don't know how to put it into words, but I know from experience when we created our neural networks models, we would get these points in the market data where you would have freak outcomes that you could not predict. You could not predict the way the market would behave at certain points. I can show you where such points are, and I can quantify those points. I know how to extract

those points and model those points. And I can tell you that at those points I cannot predict the outcome with any statistical significance. Now, I think the same problems would arise with any type of data. I could take the weather data and I could say, 'I have this tension there, there is this form swirling, and there is an eye right here, a tornado or a hurricane, or whatever.' But I can't predict if that tornado is going to hit down over here or down over there. All I can say is that there is going to be some type of chaotic element. Here is a simple thing that can be quantified and proven – well, again, it depends on which time frame you are using, so I don't want to say that quickly – but a trend is going to have greater odds of continuation than of reversal at any point. So, given that a trend has greater odds of continuation than of reversal, even if those odds are not as high as you would like them to be, you can get an edge by looking for the degree of trendiness. There are trends in the data other than the market data. Icebergs are melting X amount every year. That's a trend. Population is increasing every year. That's a trend. So I think in most data you are going to have some degree of trendiness, somewhere, in some way. And that's what this other data has in common with the market data. For example, we could see where the global climate gets warmer each year for a hundred years, and where it gets colder each year for a thousand years. So you could have trends in weather, in temperature, but if you have a trend in place, you've still got greater odds of continuing than of reversing. I mean, eventually it will reverse, unless we blow ourselves up, in which case there goes the trend with the increasing population.

J: Do you think that there are indicators that are so specific to the financial markets so that they wouldn't work when applied to other kinds of data?

LR: Sure. There are volatility indicators – range expansion, range contraction, that type of thing – that can show that there is cyclicality of volatility in the market that is more regular than the cyclicality in the price or in the direction. Everything moves, then it has to take a breather; then again everything moves, then it has to take a breather. Everybody is sucked in, and the crowed steps back; then again the crowd steps in, and the crowd steps back. Tony Plummer wrote a really good book on forecasting financial prices, where he talked about the way the market receives and digests new information – depending on the way the market digests that information and reacts, you can get a different set of information coming in. So, it's always this process, this dynamic model that most of the time is checking back and forth as it processes new information. That process might not be applicable to other data series in the same way. So, with the weather, it's not going to absorb this new information and check back and consolidate, then again absorb new information. So, that volatility characteristic, that physicality between the movement and then the rest isn't there – that 'movement followed by the rest' element is probably not as prevalent in other data series.

5.13.10 Lifestyle

J: Could you describe your working day?

LR: I am usually in my office anywhere between 7 or 8 in the morning. I am usually at my desk at 7:30 in the morning, eating my oatmeal. I always have the same breakfast every day: oatmeal, 4 egg whites, 2 cups of tea. At 8:00am I am here watching how the foreign markets are trading. I know the copper market opens at 8:10, I used to do a lot of hedging in copper. Pretty much between 8 and 4, 4:15 rather, I am sitting in front of my monitor. I go into the house for lunch for 10 minutes, and bring my lunch back in front of my monitor. I built a business so that I've got 2 trading assistants. I input stuff over the internet during the day regarding what I am watching and what I am doing. That way I can communicate with the fellow who works for me in New York and the fellow who works for me in Chicago. They are crackpots, so it keeps the humor level up – we chit chat and joke around if it's boring, or else I can bounce an idea off of somebody. So it's pretty much like being on radio live. I've got a pretty good concentration level. And when at 4:10 or 4:15 the markets close, and I'll usually log all my numbers, write all my numbers in a book. That will take half an hour. I'll do my trade analysis briefly, and post it on the web site. Then I have to leave the office and get out of the office. I am usually out of the office at about 5, and then I'll immediately go hop on a horse. So I have to do some something else, some physical activity – working out at the gym or riding a horse – where I get my mind a 100 percent off the markets and get totally absorbed in something else. I'll come back into the office anywhere between 8 and 9 in the evening, usually around 9. I'll watch the way the night markets are trading, post some charts and commentary, and then maybe I'll do some research and play around with the indicators or data based functions. Probably I'll just spend an hour or an hour and a half on the market related stuff. And then, sometimes I am in the office for 6 or 7 hours on the weekends. Nigel, one of the guys who work for me, will also be here, and we'll be doing research, testing different functions. Sometimes we'll do that till midnight. It's fun. Will I ever use it in trading? Most of it not, but you always have to be asking questions.

J: How many hours each day do you spend practicing your craft?

LR: Well, keep in mind that I am running a business, so there may be other functions in running that business, such as, for example, interacting with our website editor. Or, right now I have gotten back into money management. I sort of shut everything down in the late 90's when I was building my house and barn down here, moving, concentrating on my own monies for a while, and gave money management a rest. Now I started that back up again, and that takes some work at night, figuring out how to structure some things. If I added up all the hours that I normally spend either in my office or in front of the monitor, it would probably be 80 hours a weak, easily. But a lot of it are things such as answering emails at night or sitting here doing an interview with you. Once a year I do an educational workshop, which takes all weekend long. Or, I might do a presentation for the MTA on my latest research, and that takes time to prepare. But I would say that the markets are

definitely my lifestyle. Probably about 95 percent of the people that I know, interact with and can relate to, are either traders or other professionals in the business. And maybe the 5 percent outside of that might be my horse trainer and other horse people. But this is a lifestyle, and I am very lucky, because I love what I do. I am one of those sick people that have to force themselves to go to bed and leave the office at midnight – I have so much fun in here.

J: Are you sufficiently convinced in the validity of technical analysis that you can live without stress?

LR: Stress comes in when you get tired or when you don't have the discipline to take a break and pull yourself away from it. That's when the stress comes in. I get stressed out when I get too many things piled up on my back burner. I have to fill out this paper, I've got to send stuff to my tax accountant, I am supposed to do this, I promised this person that, I have to take the dog to the vet to get fixed, and, oh my God, it's like too many of these outside details pile up which is 10 times more stress than trading or having a position on.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[24].

Would you agree with de la Vega? To what extent does your trading control your life?

LR: Honestly, I would say none of that is true. I have the ability to walk out of the office and turn it all off. I can instantly switch to something else. I can go out gardening. I can have the worst trading day and make the most stupid mistakes, but I am going to be like your ultimate poker player, you're never going to see it on my face. I have someone else in my life, and I can immediately go and be with them a 100 percent, and just enjoy them. Probably because I have the perspective that it's just a game, and I can quit the game any time. And I love life, I love the nature, I love the sky and the trees. Even if I am having a bad day, I can go outside and just totally enjoy myself. I am just happy to be alive. I wasn't always that way. I had some health challenges maybe 14 years ago, so it sort of makes you reevaluate what's the priority in your life. And the priority for me is people and the relationships in my life, being grateful for the things that I have and for the universe, being a spiritual person, not that I am like a religious person or anything like that. The markets have made me very, very humble, because I've realized just what a little peon I am. I am

[24]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

just nothing more than a stupid little ant on this earth that's going to die some day. When you put it in that perspective, it's like, it's just a game that you can turn off at any time. I just like the game.

5.13.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

LR: I don't think it matters. It certainly does not matter for a trader. I don't think a formal education is important for a trader. If you want to do research and be a good practitioner of technical analysis, then you should be able to do quantitative research, so having a good understanding of statistics is important. But I don't think it's necessary. Again, I have this fellow who works for me in New York who has zero formal education, but if he said 'buy this market now,' I would do it without even looking at it. He's about the only person that I would ever do that with. If he were to say, 'exit here, buy here,' I would trust his eye, that's how much confidence I have in him. And he doesn't have any background and education in statistics. He is just very, very experienced in doing charts. Other than that, temperament is going to be more of a factor than education. I think that you have to have a very open mind and be a flexible type of person. And there is really no room for the ego in the markets. You have to be able to say, now this is the approach, I underestimated this, this variable is more important than I thought it was, etc. You can't get married to an opinion or a market. You have to learn to stretch and be open to all different kinds of opportunities. Sometimes I think that too much of a formal education is a big hindrance, because a lot of the education centers around models and the way things should work, but the markets aren't that way. The markets do a lot of things that the models don't predict. And models change. You just have to be very open-minded, and not get caught trying to fit the market into a little equation or a model.

J: What advice would you give to technical analysis students? What is the key to success?

LR: Well, I would say that the key to success is ultimately to do a 100 percent of your own work and rely on yourself, and not look at other people's work, (not that it doesn't have value in terms of learning from other people, from their ideas and their ways of looking at things). You've got to be open to different ways of looking at things, but a technician has to be self reliant. You also don't want to overcomplicate it. You need to have a very basic simple model, and stick with that. If you learn a very basic simple model, then, over time, you'll understand the little intricacies and nuances of it. But it's not going to work if you clutter up your model with too many variable and too many indicators, and you don't allow enough room for the model to adapt to changing conditions. You need a model with a lot of gray areas, you need a model that has a lot of these fuzzy variables and that kind of stuff – I think that's important to recognize.

5.14 An Interview with Alan R. Shaw

5.14.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

AS: This is going to be a long answer. I went to work for a firm called Harris Upham and Company in July, 1958. Essentially, I started as a clerk in the research department, and I slowly began to take on additional responsibilities assisting the firm's analysts, until I finally saw an opportunity to become a junior securities analyst myself. In our research department, all the analysts followed particular industries like steel, paper, oil, etc, and there was an opening in the consumer goods area for someone to follow food and beverage stocks, and other consumer staples. The director of research was a gentleman by the name of Ralph Rotnem. Ralph Rotnem was probably one of the greatest market historians of Wall Street in his day. He was a very astute market analyst. I was actually his statistical assistant at the time that I approached him and asked him if he would let me attempt to follow these industries that were lacking coverage at the time. I was calculating a lot of market statistics for Mr. Rotnem, as his statistical assistant. Every Thursday afternoon, I used to do a whole series of relative strength calculations on a calculator, or with a slide-rule, for all the S&P industry groups, and then I'd plot these charts by hand. At the time I didn't really understand a lot of what I was doing – I was just following instructions. Nevertheless, I found the work fascinating.

So, I did get the opportunity to follow the food stocks. It was the summer of 1960. I spent a great deal of time writing a research paper which was finally published in September of 1960. The report was called *Investment Opportunities in the Food Industry.* I went through all the basic qualitative and quantitative "fundamental" thought processes, including the investment thesis that food stocks should be looked upon as growth stocks, rather than income stocks, because of something called "convenience" foods, or frozen foods. These convenience foods carried extraordinary profit margins, and that was a major reason I thought the stocks should be looked at as growth stocks. Well, I had no idea that my report was going to be published during what was, at the time, an extraordinary bull market for consumer staple stocks. Over the next year, just about every stock that we recommended in the report doubled in price, and, in fact, some even tripled in value. So I immediately thought that I was the smartest person in the world.

My boss, Mr. Rotnem, used to commute from Princeton, NJ with a fellow by the name of Jim Morgan. Jim Morgan happened to be president of a firm on Wall Street called Morgan, Rogers and Roberts. In those days, Morgan, Rogers and Roberts were the sole, principal, purveyors of point-and-figure charts, and the statistics for maintaining the charts. One day Ralph Rotnem came to me and said he was on the train with Jim Morgan that morning, whom I had met by that time through Mr. Rotnem. Mr. Rotnem continued: 'They just published this book, and Jim Morgan gave me a couple of copies, and I thought you might be interested in having a copy.' The name of the book was *Study Helps in Point and Figure*

Technique, and it was written by a fellow by the name of Alexander Wheelen. I looked at it and I said to Mr. Rotnem: 'You really want me to read about this tic-tac-toe stuff, all theses X's and O's, or whatever?' He said: 'It's a free book. You might find it interesting.' Well, after all, Mr. Rotnem was my boss, and I wasn't going to say no to him, so I took the book. I took it home, I read it, and I found it absolutely fascinating. Of course, I didn't believe everything I read. It just didn't make sense to me that you could look at these "squiggles" and make a determination as to whether or not a stock was going to go up, or go down. But I was intrigued enough. So one day I went over to Mr. Morgan's office, which was just a few blocks from my office. I told him that I wasn't a wealthy person, but that I was interested in experimenting with this point-and-figure charting technique. I asked him if he would be willing to give me a head start, and I said I'd pay him back over time. So, for a very reasonable price, he gave me the back studies (charts) for about 20 of the stocks that I recommended in my report. I kept these charts up to date by hand and hid them in my desk drawer every day.

One day, in late 1961, I started to see some "formations" appear on the charts that looked very suspicious to me. I went back to the textbook that Mr. Rotnem had given me to read, and I found the patterns illustrated there. They were under a column called "tops." I said: 'This can't be! How could these stocks be making tops when all my fundamental news are right on line and when earnings are coming through for all my companies?! It doesn't make any sense.' So I went in and I had to confess to Mr. Rotnem that I was keeping these charts, and that I was starting to see on these charts these "distribution" patterns, these top formations. I said to him: 'How can this be? How can these stocks be topping out when the fundamental news are so good?' It was at that time that he leaned back in his chair, and I knew I was about to hear a prophecy of some type. He said: 'I think you are about to learn something, and that is how to separate a company from its stock.' I had to go back to my desk and think about that. I was really confused, because I had always thought they were the same thing. So I went back and asked him: 'You mean you are trying to tell me that the stock price might go in a different direction from the trend of the fundamentals?' It was probably a stupid question. It was at that time that Mr. Rotnem impressed upon me something that I've never forgotten, and, that is, that the stock market is a *discounting* mechanism. In fact, that is what I call one of the most important assumptions that one must appreciate and accept if they are going to practice technical analysis. The stock market is always looking ahead. The stock market seldom looks to its side, and it definitely never looks behind. It's always trying to look ahead. Stock prices oftentimes can, and do, move ahead of the fundamental progressions.

So, what had happened in my case was that the food stock prices had already discounted the improved fundamentals that I was reading about in the paper. Yet, I was starting to see the technical patterns of distribution emerge in the fall of 1961. Now, we realize that there are three animals that prowl on Wall Street: the bull, the bear, and the pig. The bull and the bear both make money, but the pig usually loses money. In the fall of 1961, we sent out a note, or a bulletin, to our brokers saying that in our view the stocks that we had recommended in our basic report had possibly reached their upside expectations, and that

we would have no objections if clients wanted to "lighten up" in their holdings. Well, the rest is history. In 1962, the stock market experienced a significant bear market. Stock prices fell 50 percent or more in 1962. The decline was exacerbated at its end by the confrontation of the steel industry by President Kennedy, who told the steel companies to roll back price increases. I can remember when the market finally made its bottom in May and June of 1962. It was a classic "selling climax" as the ticker tape was still running at 8 o'clock at night. The volume in those days was only like 6 or 7 million shares a day, whereas now we trade 6 million shares in the first minute of trading. My food stocks collapsed in 1962. They all dropped with the market, some dropped even more that the market.

The market decline of 1962 was called by the pundits of the day a "valuation adjustment." Well, I don't think Mrs. Smith cares how she lost her money – she just doesn't like to lose her money. Can you imagine that she lost 50 percent of her money and you just tell her it was a valuation adjustment? Well, in fact, it was. You see, I didn't know that 47-times-earnings was expensive for General Foods, and that was the price-earnings multiple that General Foods achieved at its top before the stock collapsed in 1962. And, indeed, the earnings didn't collapse, the multiple did. And yet, the charts were displaying to me that there was this distribution going on. Of course, those top patterns got even bigger, leading me to arrive at another assumption which I've worked with all through the years: movements in the stock market tend to have relationships to each other. Some people say it in a very simplistic way: the bigger the top the bigger the drop, or the bigger the base, the higher in space. But the point is that there is a relationship between the extensiveness of patterns and the moves that follow.

So, I was hooked on this point and figure methodology, and in 1963-64 I started to expand the number of charts that I was keeping, and that became the backbone for the development of the technical analysis research department at Harris Upham, which I headed. To this day, that point and figure library is kept up to date by hand in our chartroom. In 1976 Harris Upham and Company merged with Smith Barney to form Smith Barney Harris Upham. Now, Smith Barney had an elite, very well known and well respected fundamental research department, but they had no one doing technical analysis, so the merger from my perspective was perfect. It was perfect in the fact that I was privileged to sit on the prestigious investment policy committee of the firm. I sat next to the economist, I sat next to the director of research, I sat next the portfolio strategist, and eventually I sat next to the quantitative research manager. The technical analysis discipline had just as strong of a voice on this policy committee as any of the other disciplines, and I think that this was a first for Wall Street, so I felt very privileged to be a part of that.

J: In your early days, did you learn the craft by studying the literature on your own, or with a teacher?

AS: By studying the literature on my own. There were no real teachers in my early days, and there really wasn't anything formal in those days, not even a formal association of people who practice the discipline. We had what was called "A Wall Street Tip and Clip Club."

We'd go meet at a bar, get drunk, and exchange tips. There was nothing formal about it, because there was no MTA. It was just a group of people who had a common interest. But there was literature, and that's another amazing thing about the whole thing. First of all, you could spend time in a public library looking at the Wall Street Journal editorials of 1902, where you could see the writings of Charles Dow. The Wall Street Journal was his newspaper, and he wrote whatever he wanted to write in his editorial page. In fact, it was there that he first put forth what became known as his theory in 1902. Then, I have in my possession a course that was developed in the 1920's by a fellow named Harold Gartley. That was about the only formal training that I think I came across in my research, and I was so lucky to have found this one. There were chapters on trendline analysis, a chapter on relative strength, a chapter on momentum, a chapter on the three basic types of charts (line charts, bar charts, and point and figure charts), so I learned an awful lot from that book.

J: That was the book you used when you were initially learning technical analysis?

AS: Yes. I also used Schabacker's book and Victor de Villier's book, among others. Furthermore, I befriended a number of people. I became a friend of Alexander Wheelen's – that's the fellow who wrote that book on point and figure – but he passed away very quickly after I got to know him. He was very much impressed with my interest, so he used to spend some time with me. I'd ask him questions about some of the stuff in his book. I was very privileged to personally know a fellow by the name of John W. Schultz. John Schultz was also a point and figure theoretician. He wrote a book called *The Intelligent Chartist*, and we used to joke that you had to be intelligent to read his book. It was the first book that really described how accumulation and distribution patterns can be seen on a point and figure chart if you study the formations carefully. Schultz also got into the stronger explanation of the use of the count in point and figure, which is the up or down price target – that, of course, is part of one of my assumptions that the movements in the market have a relationship to each other. So, there were some people that I was privileged to rub elbows with, but there was not one person per se that taught me everything.

J: How much time did you spend learning technical analysis before you felt prepared to use it with real money?

AS: That's a hard question to answer. It was an ongoing evolutionary process. The very first discipline I practiced was point and figure charting. Obviously, within a year or two, because of my research and my friendships with John Schultz and Alexander Wheelen, I learned a great deal about point and figure. In fact, I would say that after 3 or 4 years of working with it, I might have been one of the authorities of the day. And, of course, we always had all the commercial bar chart services. We didn't have to keep our own bar charts because we had subscriptions to services such as Trendline, Daily Graphs, Mansfield, Securities Research, and SRC Books, so we could look at their studies if we wanted an additional input. This was a useful additional input because, as you know, the point and

figure discipline does not have any time element to it, so you can't study volume, you can't study relative strength, and you can't study momentum. A stock can stay at 26 dollars for weeks, and you won't put another point on a point and figure chart until it hits 27 or 25. So techniques such as relative strength or momentum that needed a time factor came down the road in my learning process, they weren't immediate.

I was very fortunate to work for a firm that allowed me to do what I did. To be quite honest, I think I was a fairly aggressive person. When I felt strongly about wanting to do something, I raised my views, and, as time went on, I became more confident. Now, let me back up and say that there is another philosophy that I worked with all my life. In fact, this is something that should be preached again and again and again in the research community of Wall Street. What is the role of an analyst? And I am not just talking about a technical analyst, but also about a fundamental analyst and maybe even an economist. What is the role of analysts? Why are they hired by a brokerage firm? I'll tell why I think they are hired. There are two things. First, they are hired to produce revenue for the firm. In other words, they are hired to do research and come up with ideas that clients can make money with; if clients buy those ideas, they produce commissions. The greatest thrill in my early days was to recommend a stock and watch that stock suddenly start printing across the ticker tape – I would find out the next day that we did hundreds of shares of business because we sent out what we called an "all wires" message. Harris Upham was like a wire house. We had 75 branch offices and say 1500 brokers across the United States. (Now, of course, Smith Barney has 12,000 brokers around the world.) We would send a wire message out which would be read in all those offices, and all of a sudden I would see the stock symbol printing on the tape. That was great thrill – I was producing revenue. In other words, I had a following. Why did I get that following? Because I was a nice guy? Of course not. I got that following because my ideas were working out. So that was the second greatest thrill – to be right. Produce the business and be right, recommend a stock at 20 dollars and see it go to 25 after you did business in this stock for the firm – that was fun! That's my view, and I think it's applicable to fundamental, technical, or any other kind of analysis.

J: Was there a particular mistake that you learned a great deal from?

AS: Well yes, actually. And it's a mistake that I'd probably make again because there wasn't really that much that could have been done about it. What happened was, we sure had a trading list that we monitored. In good and bad markets we always tried to have ideas for our brokers to use. One day I went out with a short sell recommendation on a stock called Teledyne, which is no longer around. The stock was selling at 120 dollars, and I thought it looked like it was going to fall to at least a 100 and maybe even down to 80. Well, we found that this might make a decent short sale recommendation, because we had some stock in the house which meant we had stock we could loan to make the short sale work. Indeed, the stock fell from 120 to 110, and the next day we were watching it fall to 106. Then, after the close this particular night, the chairman of the company came out with an announcement that he was going to have a stock buy-back program and that he was going

to spend up to a 130 dollars a share. We were trapped. The stock opened at 125 the next day, and we immediately had to cut out the loss at 5 points. Were we wrong? We were on our way to being right until this happened, and I don't even think the Teledyne chairman knew what kind of recommendation we had outstanding. That incident stands out in my mind, but I can't really say it was a mistake on our part, though we had certainly made a recommendation that turned sour.

One of the great things about technical analysis is that it should always be practiced with the thought and the knowledge that we don't have the answers. Our technical research allows us to ask questions. If we have more positive questions than negative questions, we simply conclude that we may want to be long. If we have more negative questions than we have positive questions, we conclude that we want to be out. There is an old Wall Street slogan: "When in doubt, stay out." There are only two losses that a broker has to report to his client: the loss of client's money or the loss of an opportunity. So we always ask ourselves what's the easiest loss to report. Obviously, it's the loss of an opportunity. We rather tell the client, 'Gee, we should have owned the stock because it went up, but we didn't own it,' than, 'Gee, we shouldn't have owned it, it's gone down and we lost money.' So I always have tried to practice in a very risk-averse way and have as many positive points in place as possible. If, as I watch the progress of a stock, all of a sudden I see its complexion beginning to change, making it no longer look like the stock I originally recommended, it might be reason enough for me to pull back and reverse my decision. We are always watching to see if the complexion of the price pattern of a stock is turning from a bullish to a bearish one.

5.14.2 Personal style

J: Could you describe your own distinct style of technical analysis?

AS: We certainly won't make it out to be something that it isn't. Years ago, when my only computer was my slide rule, people would ask if technical analysis was an art or a science, and I used to reply that it was more of an art. But nowadays, with the computer on the scene, we are able to go back, do historical studies, and optimize results. Even a simple moving average crossover is now much more readily quantifiable. So you can say that technical analysis is now in part quantifiable, and that therefore it could be considered a science in some respects. Well, it's a combination of both. I wrote a piece in 1995 called *JAPAN vs. US.* I discovered that there was a pattern in the US stock market developing that could be overlaid on the Japanese stock market with a 13-year time shift. It was phenomenal. This was the Japanese Nikkei, which at one time was the second largest stock market in the world, market-value-wise. So we were comparing apples to apples, not apples to oranges. And the conclusion of our piece was that if this pattern were to maintain, by the end of 1995 the Dow Jones Industrial Average might begin to accelerate to the upside, perhaps going to 10,000 by the year 2000. It was 4,700 the day we published that piece, and it reached 10,000 by 2000. The likeness of supply and demand characteristics we were comparing was phenomenal. Now did we really know that was going to happen? Of course not! But our

research allowed us to suggest the question: Is it possible that the DJIA is on the same trend of the Nikkei before it topped out at 40,000? We created a lot of followers by the publication of that piece too, because it turned out to be so accurate. Listen, all we are doing is asking questions. We don't have the answers. It was a fascinating piece to research and a fascinating piece to write.

Let me follow up real quick, because my swan song, so to speak, my last good piece of research was published here in March, a month before I retired. It was called *Will Dow 10,000 become Dow 1,000 and/or Dow 100?*. Let me tell you about the reason we published this piece. First of all, I lived through 17 years of the Dow Jones average bumping against 1,000. I had to go back and do research about 100, because that was in the 19-teens to the 19-twenties. And I found incredibly interesting similarities in patterns. I found, for example, that there were five cyclical bear markets and four cyclical bull markets at or around a 100, and that there were five cyclical bear markets and four cyclical bull markets at or around a 1,000. So the piece simply asked the question: 'Will 10,000 become like a 1,000 or a 100?' We concluded that maybe we had the first cyclical bear market in 2000-2002, and that we were in the process right now of concluding the first cyclical bull market and therefore looking forward to the possibility that there is another cyclical bear market that we have to see.

J: Could you describe your personal style of technical analysis in more general terms? You said it was both art and science.

AS: Yes, it's both. If you started to read off different disciplines, I could very quickly say 'yes, no.' For example, do we embrace the principles of relative strength? Yes, very strongly. Do we embrace the principles of momentum? Yes, very strongly. Do we embrace the principles of trendline analysis (which you can implement with a pencil and a ruler)? Yes, very strongly. I used to always kid everybody that you don't have to be wealthy to be a technician – you need 40 cents for the ruler and 10 cents for the pencil. You only need 50 cents worth of equipment to make multimillion dollar decisions. Furthermore, there is some stuff out there that I read about every now and again, and if I am interested I'll read about it further and perhaps practice or embrace it. But if I had to define my personal style, I'd say it's in the common land: relative strength, momentum, MACD, stochastics, and all that kind of stuff. MACD is momentum, stochastics is overbought-oversold, which is a form of momentum, but these are all more quantitative ways because they are computer generated, rather than slide rule generated. I'll use a simple rate of change histogram and MACD, which goes a step further – it's an oscillator rather than a histogram. As I go back in time, I think that the reason our approach was embraced so readily by clients is that we always try to educate them as well as give them the conclusions. We let them know how we arrived at the conclusions and what was behind the research. For instance, I've always found it interesting that a lot of people blindly conclude that an oversold condition is bullish and that an overbought condition is bearish. If you think about it, it's just the opposite. You see, by definition, if the stock market becomes overbought, that's bullish. If you understand the statistical makeup of an overbought-oversold oscillator, you'll see that the fact that it

reaches the oversold condition is bearish, not bullish. You listen to many people on the cartoon network – the CNBC – and what you may hear is stupidity. They say they are bullish because the market is oversold. You know what? On October 12, 1987 the stock market went into an oversold condition and a few days later, it crashed 500 points in one day. It wasn't until the 3rd of November that it came out of the oversold condition. You can see it on our Chartroom wall. So what was the better day to have bought, the day it went oversold or the day it came out of the oversold? These are the misconceptions that we try to educate our clients about so that they understand. Sometimes they'll read someone else's piece and they'll read our piece, and they'll find that both pieces are looking at the same indicators but saying something entirely different – we don't want our clients to be confused in such a situation.

There is another point I want to make to you about the art side of technical analysis. People used to think that technical analysis was a self-fulfilling prophecy because if you show the chart to three technicians you are probably not going to get the same answer. That's not true. There is an interpretation. It's just like if you show a balance sheet to three fundamental analysts, you are probably going to get three different opinions. One is going to say that the working capital is OK, the other is going to say the working capital is not sufficient because of the type of business they are in. And the other thing I find interesting is that when you ask people about the definition of technical analysis, sometimes someone will raise their hand and say: 'You look at the past to predict the future.' Well, I stop them in their tracks and say: 'Tell me, what is a balance sheet? Is that a look at the future or a look at the past? It's obviously the past. What's an income statement? A look at the past. What's today's PPI report? It's the past. What's the unemployment number? It's the past.' All forms of analysis look at the past to get a feel for the future. So don't condemn technical analysis as if it were all by itself in looking at the past to predict the future. All forms of analysis look at the past to get a feel for the future.

J: How much of what you learn from others do you directly apply in your own analysis?

AS: That's a tough question, because there is no way you could quantify this. I'll go to an MTA seminar, and perhaps an idea will come out of that seminar that we will further research ourselves. I would sit next to Dick Arms at a dinner, and I would learn something just by listening him talk. I'd sit next to Paul Desmond at a dinner, and I'd learn something. My firm has been a Lowry subscriber since the service started in the 1930's – we have their studies on the wall in our Chartroom all the way back to 1932. That's a service that we particularly like because it does help identify the forces of supply and demand through a more quantifiable approach, that is, through their buying power and selling pressure indicators. Obviously, if buying power is going up and selling pressure is going down, the price has to be rising – that's a simple thing.

J: How do you learn what works for you and what does not, without making big loses?

AS: I don't know the answer to that, but I can tell you a funny ironic story. Let me just put some background to this first. Setting up your own technical research effort is like a triangle. First you have to produce work on your overview. You are going to have to know the general market environment you are working in, and you can develop that posture on short, intermediate, or long term basis. That's one part of the triangle. Then there is your sector work and your stock work as other two parts of the triangle. Oftentimes your stock work can assist you in your overview or in finding groups you are going to like. So that's our approach, and there are standard indicators that we follow for the stock market. We have nothing really that we can say is super-secret or super-proprietary. In the words of Stan Weinstein, we are constantly weighing the evidence, so to speak.

Our sector work had always been very strongly relative strength oriented. Way back in the early 1980's, in order to make our sector work understandable to our clients, we developed a so called "buy, hold, avoid, sell list," that we would update every week. I used to call it "adore, love, hate, detest list," instead of "buy, hold, avoid, sell list." This was long before Wall Street analysts were told they had to have sell decisions. I mean, we had had sell decisions for years prior to that. Since our work was always relative strength oriented, we always had groups to buy in a bear market and groups to sell in a bull market.

Back in the mid-80's, I got this idea about developing a model portfolio based on our "buy, hold, avoid, sell list." First off, if a group is on our avoid- or sell-list, we will never own that group. So that's simple. Now, if a group is on our hold-list, the model will take a one to two times market weight in that group. And since the group data are available every week – being S&P based – the difference between one and a two is subjective to a degree. So we are talking about 1.8 or 1.3 instead of 2 or 1. And if a group is on our buy list, we will take 2 to 3 times market weigh, to show our clients how much we really like that group.' So, the model had a discipline. We would produce this model every week. What was helpful about it was that we could then go back and show our clients where we were overweighted, and where we were underweighted, based on our technical analysis of the sectors. This was very helpful, particularly to our institutional clients. And, of course, the model was priced every week, so we were able to show them how it was performing and whether it was showing us the return that was viable and worthwhile.

Was our group work adding value? Well, yes. We significantly outperformed the S&P 500 for the years the model has been in effect – all this is published. It's a lot harder to outperform in a bull market than it is in a bear market. It really is. In a bull market you can throw a dart and make money, but that's absolute return. We are talking about outperforming, about being better than the benchmark. Our model was up here, the market was down here. The irony is, in the fall of 2000, there was quite a clamor from the sales force and the firm asked us to develop a mutual fund based on this model. And I said to myself: 'I know this is the market top now. After all these years that we've published this thing, and now they come to us.' So against my better internal instincts – I thought the stock market was beginning to look very precarious – the firm raised 400 million dollars, forming what might have been the first mutual fund to be run entirely based on technical analysis. Unfortunately, the fund has not done that well as the model, and that has been disappointing.

J: Is your analysis more effective when you are working by yourself or when you are working with others? And, in general, is technical analysis better done working individually or in teams?

AS: The answer is both. In running our department over the years, I've been fortunate to have good people to whom I could give assignments. We've always looked at our work as a team effort. We've always been recognized by our clients as a team. We had the team broken up to tend to different responsibilities – one person would be looking more at fixed income trends or commodity trends, another person would be doing foreign stocks and global stock work, yet another person would be doing global markets, and so on and so forth. And, of course, we'd meet once a week and talk about what we were looking at, so we'd all know what basis we were on. Our research publications reflected this. For example, our weekly report has sections such as the overview, the sector work, the stock work, the global work, the fixed income work, etc. A year or so ago we made a wonderful call on gold stocks, and the first tip-off came from the person who follows commodities. And then we looked at the individual charts, and we made a conclusion that the stocks were in the process of breaking out. We told our clients to start buying the stocks, and, indeed, the stocks went up. We made a lot of money for our clients, and the firm got of lot of business in commissions.

J: In what kind of market conditions do you make most mistakes?

AS: Back in the 80's, we manufactured 20,000 tee-shirts – on the front it said "the trend is your friend" with an arrow pointing in one direction, and on the back it said "the trend is your friend" with an arrow going the other way. It's obviously important to have a feel for the type of market environment that you are in. You can get that feel by following indicators with different time horizons. For example, in our chartroom we have a daily wall, a weekly wall, and a monthly wall, that is to say, we look at things from short-term, intermediate-term, and long-term perspectives. It's always important to understand whether you are dealing with a trading market or a trending market. Obviously, trending markets are kinder to you than trading markets. By definition, the potential for making a mistake is a lot greater in a trading market than in a trending market, because "the trend is your friend." It's like with surfing, where you get on the top of a wave and you stay with it until it dies. You use the trend in your favor. You don't go short in an uptrend, and you don't buy on a downtrend. One of the reasons fundamental analysis is sometimes so erroneous is that their analysts buy the stock because they think it's cheap. But what does it do? It gets cheaper, because the basic trend is down! So we'd rather say, 'let someone else's money turn the trend around, I won't put my money to turn the trend around.'

J: How much of what you do are you willing to share with others?

AS: It comes down to recognizing why you are here. I am not doing this for my own

portfolio. I am doing this because I am an employee of a prestigious firm, and I have a responsibility to share my knowledge with my clients. So I'd say we share our weekly policy meetings, our weekly writings – that's why we are here.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior success?

AS: Let me try to give you specific examples. Let's take the advance-decline line. Often, at the end of the day, I hear people talk about how there were 1,000 stocks up and 900 stocks down. First of all, it's not correct to use the word "stocks." The word "issues" should be used instead, because not all that trades is stocks per se – some are ETF's, some are preferred stocks, some are closed end bond funds. If anyone does an analysis of all the issues that are listed on the NYSE, they'll find that there is an awful lot of non-stocks. Well, some people don't have a realization of that, and they just look at the indicators blindly. That upsets me, especially nowadays when there is something afoot that is disturbing the pattern formation of some of the indicators, and that something is called decimalization. The fact is that now a stock or an issue has to go up only one cent for it to be considered an "up"-stock, whereas in the old days it had to go up at least an eight of a point, or 12 cents. It's a lot easier to go up a cent, than 12 cents, so, on any given day, if you assume the upside has the bias, there are going to be more issues up than issues down. That's skewing these indicators.

As I used to teach in my classes, forecasting the direction of the DJIA is a non-brainer – all you have to do is a very thorough analysis of the technical condition of the 30 stocks that comprise the average. There are only 30 of them, not 500 of them, and you can take particular interest in the higher priced ones, because you know that the DJIA is a price weighted average. It's not capitalization weighted like the S&P is. Now, suppose that the highest priced stock is down 10 percent or 10 points, and that the lowest priced stock goes down 10 percent which could be one point, say from 10 to 9. Because DJIA is a price weighted average, that little stock has no real effect on the direction of the average itself. You are probably aware of this, but do you know that every one point move in a Dow stock currently translates into 7 points in the average itself? That's true. So, you see, you have to have knowledge of this if you are going to forecast this average. People are going to come to you and ask where you think the Dow is going, and you have to have an understanding of how the average is computed and what stocks influence the average the most. Otherwise you have no right telling someone what's your opinion of the average. That's what I think we try to do. Let's say I go to a client and say I think the Dow is going to drop 500 points – the client is correct if he says: 'OK, big shot, which Dow stock would you sell short?' If I don't have a short sell candidate, how can I say that the average is going to drop 500 points?
J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

AS: It depends on how exactly you want to quantify the term "signal." Our Chartroom wall is broken up in a daily wall, weekly wall, and a monthly wall. So the chances are, if

there is a change developing in the equity market, you are first going to see it on a daily wall, and then it will eventually move over to the weekly wall when it becomes more structural. So it's not something that's quantified by some sort of a program, it's just an observational factor. You've seen how long the daily wall is. The best way to look at the daily wall is from 10 feet away – then it speaks to you better. You can see the overboughts, the oversolds, the trend breaks, and all that. The signals are going to develop there first, so to speak. A signal could be a trendline violation, a signal could be a moving average violation, a signal could be a breakdown from an overbought condition or a move out from an oversold condition, all of which could potentially become more structural in nature.

J: Is technical analysis more effective when used on its own, or when combined with fundamental or some other kind of analysis?

AS: Very good question. Technical analysis tells you when, and fundamental analysis tells you what. Moreover, the fundamental analysis deals with the analysis of companies, whereas technical analysis deals with the analysis of stocks – you have to separate the two. When I was the director of research for a few years at Harris Upham, I told the analysts: 'I don't want you to tell me what the stock is going to do. That's my job! I want you to tell what you think the company is going to do, and then we'll combine our thoughts. There are going to be times when we are going to be at odds – you are going to be bullish on the company, and I am going to be bearish on the stock – and we are going to have to work together on that. And, as time passes, we'll see how it works.' After I said that, some analysts quit on the spot, because they didn't want to work under such a regime. I wished them good luck. I also had some analysts who stayed on, and, over time, we had a lot of fun combining the two approaches. We sometimes disagreed, but I always used to think that we were like a cowboy who has two holsters instead of one. If a cowboy sees somebody he doesn't like, he pulls out both guns and shoots. The potential of knocking off the target is a lot better with two guns than with one. If technical and fundamental are in agreement, that's a powerful argument. Recently, our technical research drew our attention to the performance of Newmont Mining stock, and we issued a buy recommendation. At the same time, our fundamental analysts had it rated a one (buy). They were so thrilled that our technical work was supportive of their work, and we were so thrilled that their work was supportive of our technical research. The ability to do business increases when there is such an agreement. That agreement allowed us to do twice as much business in that stock compared to what we would have done if only one of the approaches were telling us to buy.

Any broker in our firm can use his machine to call up a quote on any stock. At the bottom of the page of the quote there are two ratings on that particular stock: a fundamental rating and a technical rating. There are times when the fundamental reading is a 1, which is a buy, and a technical reading is a 5, which is a sell. Then it's up to the broker. The broker has to ask himself: 'Well, should I go against the technical guys and buy this because fundamental guys say to buy?' It's broker's decision. We found more times than not that if both of the two approaches are rated 1, that's a powerful argument to be involved

with. Some brokers are smart, and they say: 'Why should I take a risk? Technical guys could be wrong, but why should I risk my client's money when just one recommendation says buy?'

5.14.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

AS: I've answered this partly when we talked about the advance-decline data – I have my suspicions about their validity today versus in the past. However, the concept is still very good – the direction of the issues represents the direction of the "army," while the DJIA represents the "generals." It makes sense militarily that both the generals and the army move in the same direction together. We used to be able to spot divergences where the generals kept going up and the army began to retreat. In real life, the generals cannot win because there are only 30 of them. In almost every case in market history, if the army started retreating, the generals eventually followed the direction of the army. From that perspective, the advance-decline line is probably still a valid indicator, but you have to be careful because of the 1 cent versus 12 cents decimalization problem I described before. So that's potentially one of the less reliable technical indicators.

Now, what do I consider to be the most reliable indicators? We look at so many configurations, and I talked about them before. One thing I would like to add is that we also look at sentiment – that's important. But we don't look at sentiment because we think these people are wrong. We look at sentiment because it gives us an understanding of the direction in which market psychology is going. There may be extremes at tops and bottoms, but it's really the direction that matters.

J: How do you test patterns or indicators before you start using them with real money? Do you ever ask for other people's opinion when you are making such decisions?

AS: The answer to the second part is yes. I had a fellow who worked here with me for a number of years. His name is Robert Colby. He went on to write a book, *The Encyclopedia of Technical Market Indicators*, which you should have a copy of. The answer to your question can be found in that book because what he did was to go back and test the effectiveness of many, many indicators. It's very easy for me to validate the usefulness of pattern identification. I can come back to you with that answer very quickly, because we both work with the understanding that the pattern is developed by market forces of supply and demand under way.

For instance, let's consider a "head and shoulders" top, or bottom. This is funny terminology, isn't it, because it makes people think of a shampoo. Now, a head and shoulders top simply captures the ending of an uptrend and the beginning of a downtrend. It's the forces of supply and demand that are creating that pattern as it unfolds, shifting a pattern of demand into a pattern of supply. It's that simple. Let's take an ascending triangle. Why do we perceive that this pattern may resolve itself to the upside? First of all, we have to

understand that price patterns have their place within a stock's progression. There are *reversal* patterns, and there are *continuation* patterns. Head and shoulders is usually a reversal pattern, that is, it indicates that the trend is reversing from up to down or from down to up. Ascending, descending, and symmetrical triangles are continuation patterns, and you'll find them more often *within* a trend. Now, an ascending triangle shows you a pattern of supply being essentially neutral, but underneath this neutral supply there is an aggressive demand, as manifested in the higher and higher lows. So, because we see the aggressive demand and the neutral supply, we assume that this pattern will resolve to the upside.

So, you see, there is some simple logic behind the interpretations. You have to understand that each of these patterns is a pattern of supply and demand. As I just explained, if you get into the concept of an ascending triangle and understand that in that case the demand is more aggressive than the supply, you will immediately understand why it's reasonable to expect for that pattern to resolve itself to the upside. And you can test a pattern like that simply if you take the time to go back and find them.

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

AS: Again, that's a tough question to answer because it comes down to interpretation. For instance, I can show you, on our daily wall, a lot of periods when the market was overbought. You'll see, when you look at the price trend, that that was a bull market. So some people might look at that overbought condition and think of it as a bearish notation, where in our view this was a condition of the bull market. This was proof that a bull market was in place. So, from the of top my head, I can't really pinpoint or identify any indicator that has been misleading in terms of the market trend that was in place, because we always try to understand the overriding trend.

As another example, something interesting happened back when they did away with fixed commissions many years ago. It was called May Day. I forget which series it was – maybe it was the specialist short-sell ratio. I noticed something interesting happening, and I was able to find that it was based primarily on the fact that fixed commissions were now negotiated rates.

Talking about this specialist short-sell index, another time in fact I found that it was doing crazy things, so I called up a specialist friend of mine and found out that they had different accounting ways. They had to mark to the market as the end of the year approached, so from that point on, in all the years that followed, I never looked at that indicator in the last few weeks of every year, because I realized it would be skewed by the bookkeeping work.

You find that kind of thing lots of time. There was a time, for example, when we made a very good market call questioning the validity of the sentiment indicators. They were in a position that they weren't supposed to be in for this particular market environment, so we questioned: 'Why are they in that position? Is the indicator wrong or is the market wrong?' It turned out that the indicator was wrong, so we were able to take a different market stance, publicly questioning the validity of this indicator at that particular time.

J: Is the number of indicators you follow always pretty much the same or does it vary? Is the number of indicators you follow perhaps greater when the amount of money involved is larger?

AS: First of all, we are always flexible. If we see an indicator not operating correctly, we'll question if there is something wrong with the data or if there is something wrong with the indicator at that particular junction, or both. I remember back in 1998 we saw the advance decline-line top out and start down. This decline continued all the way through 1999. I sat there, looked at it, and said: 'This is amazing, because the market keeps making new highs every day in the S&P or the Dow, but the army has been retreating now for over a year. Is there something really bad in front of us?' We used to ask that question out loud in our written pieces, though, of course, our clients didn't want to hear anything about it. The market supposedly was then making new highs every day, and we had no idea we were going to see the type of market decline we saw from 11,000 to 7,000, or so. But, indeed, the advance-decline line was certainly warning us that something negative was happening under the surface. On the surface things looked good, but inside the market they looked ugly. Did you notice that our Chartroom doesn't have any windows? Only on the computers we have windows. There are no windows because we want people to understand that when they walk into that room, they are looking at the inside of the stock market. They are not looking at earnings, they are not looking at products, companies, or managements. They are looking at the market's internals, the inside of the market, where the forces of supply and demand are at work. So that's why there are no windows. You walk in that room, it's pure and clear that it's the inside of the market that technical analysis is all about.

So the number of indicators that we follow is constantly changing – we add and drop indicators as the market environment changes. For example, the number of issues listed on the NYSE continues to increase. The impact of the Nasdaq has grown in recent years because of the way technology has evolved. We take that into account as we look at the different indicators. So, what we might be doing is supporting our Nasdaq call with the work that we do on technology groups and stocks. Or, we might support our Dow Jones call with the work we do on basic material stocks, because Dow Jones is more heavily weighted with industrial basic material names (although that's changed in recent years). Again, our work is really being dictated by outsiders. For instance, when there is a substitution in the makeup of the Dow Jones average, our interpretation of that average and the indicators we use with it have to change. If a higher priced stock or a lower priced stock is added to the average, that immediately has an impact on our analysis, because we know it's a price weighted average. In 1940's they took IBM out of the average and replaced it with AT&T. The Dow Jones would have gone through a 1,000 many years earlier if they hadn't taken that stock out. Similarly, the changes in the makeup of the groups may lead us to change the way we analyze the groups.

5.14.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

AS: One of the things I had to do when I retired was clean out my office. It was quite a chore. There was a lot of stuff in there. I came across a transcript of a panel that I was on for the very first annual Institutional Investor Conference. The Institutional Investor Magazine holds a conference every year and there was a panel on technical analysis that I was privileged to be on. There is a transcript of the whole thing. This was in the late 60's. There were over a 1,000 people in the room, and my guess is that a lot of them came to be entertained. They probably thought that they were going to see four people with pointed hats arriving on a broom. I think a lot of them probably left with the understanding that this was not witchcraft, that this was not sorcery, and that there was something legitimate attached to it.

Moreover, means of communication are much more readily available today than ever before. When I was starting out in the business, it used to take me 20 minutes to get a quote. It's true. We had ticker tapes that went across the wall, of course, but to get a quote you had to call down to the floor. You couldn't press a machine and get an instant quote. Alvin Toffler wrote a book called *Future Shock*. There he talked about the acceleration of the rate of change. In my view, in no place has the acceleration of the rate of change appeared more dramatically than in the stock market. To a degree, Toffler's book prepared me for the future, and how to accept the computer, email, the instantaneous communication. We send out a "tech fax," and all the brokers and all the clients see it immediately – it goes right to their computers and is announced by a big flash. It's incredible. We recognize that that has possibly affected our indicators as time has passed. Market movements could appear faster, times might get more volatile. So we recognize that, and we go with that flow as it happens.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions?

AS: Absolutely. There is a poll that's taken every year by the *Institutional Investor* magazine which rates the firms like ours from the point of view of the institutional client base. After Bob Farrell backed off we got sucked into a number one spot on the *Institutional Investor* magazine poll for a number of years running. That category used to be called market timing. I was responsible for lobbying them to call it technical analysis. They couldn't call it technical analysis immediately because they had some people in there who didn't really practice technical analysis, so they finally came up with a "quantitative research" category which was really what those people were doing. The point is, we certainly could see where we stood among our peers that were attempting to do the same kind of analysis and sell it to the clients. I was always interested to see what approach Bob Farrell was talking. One fellow I used to exchange work with, who retired many years ago, is Tony Tabell. I got some ideas from him, and possibly he got some ideas from me. But we always want to see what the competition is doing. There are also a lot of independent people out there doing technical research, whose work I follow. For example, Stan Weinstein, who is down in Florida, has

been around for years.

J: To what extent has the introduction of the variety of computer software aided the craft? I know you've already mentioned some aspects of it. Is there anything else you would like to add to that?

AS: The general public, which include both professional and nonprofessional investors, have at their disposal a variety of technical software, and with it they are now able to see more clearly what we do. You can subscribe to MetaStock and make your own charts, draw your own trendlines, put on your own moving averages, create your own relative strength numbers, do your own momentum calculations, if you want. You can use the same TC2000 software I like to use, and subscribe to the same chart services we subscribe to. There are a lot more people now who get their hand on that than in the past, and that's been a great help. Now, the problem is, some of this software lacks in certain respects. Sometimes I get into debates on the use of software in point and figure analysis. Having been a devotee of the practice for years, I see people today accept some of the more commercially available studies of X's going up and O's going down, thinking that that's basic point and figure. It's not. It's a variation of basic point and figure. So I try my best to educate people when I see that they are on that subject. I tell them: 'The way the discipline got its name is that every time a stock goes up or down a point, you put in a figure. They don't call it three box and figure, they call it point and figure. And you make three box reversal charts after you have made your one point reversal chart.' Computer software that's out there still to this day does not do basic point and figure. It's latched onto what they think is the more consumer friendly three box reversal method. So, some the software is not the end of it all, but it's a help.

J: To what extent do you rely on computer generated signals?

AS: I would say that somewhere in the range of 40 to 60 percent of the time a computer generated signal will be relied upon, because we have had the ability to back-test those signals at other points. Remember that those signals may be based on the same calculation, but the first one will come based on daily data, the second one on weekly data, and the third one on monthly data, allowing us to look at things from short, intermediate, and long term perspectives. We have different people in our department assigned to this. You can see that in this chart book some of these historical back-testing studies are presented with arrows at the bottoms and arrows at the tops. And some of these studies are incredible – I mean, our indicators have been able to detect the bottoms and the tops almost at their peaks. That's a very effective discipline, and you can see that if this had been followed in the past, it would have made money. So, I'd say we rely on computer generated signals 40 to 60 percent of the time, and I am purposely evading 50 percent, because that's a coin flip. But, to get really to the bottom of your question, I'd say that we would give a particular mechanical signal a 40 percent weight if other indicators were non-supportive, and we would give it 60 percent

weight if our subjective work was supporting it. Sometimes you really feel great about the mechanical signal because you have other work that supports it, other times you are not feeling so great because some of the other work isn't in place.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

AS: Yes, if you can. It's like with anything else – the more you do it yourself, the more it will mean something to you. Just think of the fact that if you are doing a chart by hand day after day after day, you are watching a trend unfold right in front of your eyes, instead of once a week opening up something and maybe finding a trend there. I had a student once who drove down from Massachusetts every Tuesday night for class, and for his term paper he gave us a pictorial of a room he converted in his garage upstairs into his own Chartroom. He constructed tables on a slant. These tables were going down the length of the room, and on each table on that slant there was a chart. Every night after the market closed, he would walk to that room and update every one of those charts by hand. It was incredible. He would have "look for a buy" labels on some of the charts, "look for a sell" labels on some others, and "unclear" on the rest, and every day he would put in a few hours to update his charts.

People still question us when they see the daily wall in our Chartroom: 'Why do you still do this by hand when it's all on a computer?' Well, a computer can't draw a 9-foot chart every day for us and show 20 years of history on it. Going so far back in time is hard to do on a piece of computer paper – it's much easier to do that on a 9-foot chart.

5.14.5 The innovative process

J: What drives your innovative process?

AS: That's a great question. We have to be inquisitive, and that's what I think some of our better pieces have accomplished. We've published so many think pieces over the years, including this last piece of research that I did before I retired. Just doing that research was great fun. But it's important to make it clear to people that you don't have the answers, and that all you are really trying to do is present a platform, or understand the environment.

I had the unfortunate experience of traveling down the WestSide Highway the day that the first plane hit, looking out of the window, and watching the second plane come right in and hit the second tower. Right in front of my eyes I saw it happen. And what we had to do in that crisis was get on the box and tell our brokers: 'We were in a bear market to start with, and this is certainly not a positive event; the market is already in a declining trend, so don't be surprised to see it go down even further when it starts trading again.' If this had happened while we were in a bull market configuration, chances are the market still would have sold off, but not as dramatically as it did. What happened was the result of the crisis

that we were trapped in. But getting on that box and trying to sound like we knew what we were talking about was our job. We had to be innovative at that point.

I also remember the crisis of 1987. When I retired, I received so many notes from brokers, and some of them were so overwhelming. A number of them remember how I "held their hand" in 1987 when everybody else was panicking, because I was able to quickly pull out some research. *The New York Times* carried a front page article that somebody had put together about how the market was tracing out a formation like the one in 1929. That's all our people had to hear, in other words there was going to be a lot more to come. So I was able to quickly put together some research. We watched how on Tuesday, Wednesday, and Thursday, the market began to grip, and finally, by the end of that week, we were able to make a statement that any relationship to 1929 was not a valid research suggestion and that the market was now simply going to stabilize. That worked out, thank Goodness, to be the truth.

Both of those were times of crisis, and we tried to figure out why we were here. We were here to get on the box and, as professionals, talk to our clients and our brokers. We realized we didn't have the answers, we were just trying to present a scenario that luckily in both cases worked out to be correct. Thinking of a technician as a short-term trader is truly a misconception. We had all this research, all these patterns and past experiences, and, as technicians, we looked at them, analyzed them, and made comments about them. So, those are some examples of situations that drive us to be innovative. And, of course, we are able to be innovative because we have all these resources at our disposal.

J: Do you and to what extent collaborate with others during the innovative process?

AS: The answer to that question is yes. I would certainly consult with the best of the staff. I was a member of the Investment Policy Committee, and I'll tell you about one of my experiences there because that was really quite interesting. When our firms merged in 1976, I found myself placed on this committee along with an economist, a strategist, the quant guy, the director of research, and so forth and so on. The first number of weeks they would go around the table and it would come to me, I really didn't have that much to say, and someone actually questioned whether it was worthwhile my being there. I had nothing to contribute. But then all of a sudden in the summer I told the chairman, who's become my closest personal friend ever since, that I had a lot to say, and I asked him if they could start with me first this particular day. I had a lot of studies with me, and I said: 'Well, I am going to tell you that I see now about 15 reasons why the stock market might go down, and only one or two reasons – and they are basically not very strong reasons – why it might continue to go up.' So I presented my case along with whatever indicators I was using, and, with the lack of a strong objection from everybody else, the chairman said that he was going to raise cash. We had a model that we used to exchange ideas with the brokers that we thought the institutions might be interested in as well. That was September of 1976. In October of 1976, we had fairly bad down days. The market did go down, and the committee got written up in Business Week magazine. The piece was called *Smith Barney's Accurate Marksmanship.*

There was a picture of the chairman, and a little paragraph said 'the committee also included 37 year-old Alan Shaw who came abroad from Harris Upham and Company.' They were very nice to add my name there. I still have a copy of it.

J: When you encounter a classical indicator that's no longer working, do you try to change your interpretation of it, or do you discard it as useless and invent something new?

AS: Both. This is getting back to my earlier point about decimalization. Decimalization has not only affected the advance-decline line, but, if you think about it, it's affected the high-low statistics as well. Nowadays it's possible for a stock to go up one cent and make a 12-month high, right? So, the decimalization has distorted these statistics somewhat, but we still keep them on the wall. However, where in the past we used to give them the strength of 10, we now give them the strength of 6. They are still being followed, but with the caveat that we may have to keep a close eye on them. We may not pay as much attention to these high-low statistics as we used to, but, in all, they are still worth doing. Let me see if I can say this in a proper way here: the stock market really isn't performing the way it should be performing given how the indicators are looking right now. The stock market, if you call the stock market the Dow Jones Average, or the S&P500, is not as strong as the indicators say it should be. So we are trying to get to the bottom of this, and still with the caveat though that the basic background, or environment, could be, say, like it was around a 1,000 for 17 years, or around a 100 for 18 years.

J: Are there indicators that used to be very useful in the past, but that have become totally obsolete and are no longer useful no matter how you interpret them?

AS: Yes.

J: Could you give me some examples?

AS: For example, the Specialist Short-Sale Ratio is no longer followed as closely. In fact, I don't even think the data is as available as it used to be. Of course they were great indicators in the past because you wanted to have an understanding of what the professional guy was doing. A specialist couldn't afford to be wrong because it was his money. I think that has become obsolete.

J: How soon after you develop a particular technical tool do you make it accessible to public?

AS: I have no idea how to answer that question. A frustrating thing is going on right now with Wall Street's research – certifications and disclosures are encroaching upon us more and more today. We have to confront the bureaucracy. We cannot even present ideas to our clients until they go through some sort of a sensor board. I mean this is awful what's

happening and the impact it's having on our ability to function. So, right now we are being hamstrung by this. When we come up with idea, we first have to get it cleared by all the legal people, before we can share it. This is in a way answering your question. I mean, how soon can we share with the public?

J: OK, so it's the matter of overcoming the legal barriers.

AS: At this point, yes.

J: But you would like to share everything you do?

AS: Of course. Absolutely.

J: Then my question is why would you want to share with others your inventions and everything you do, rather than keeping the edge just for yourself?

AS: That's a good question. There was a guy who used to ask the question: 'If you are so good, how come you are not rich?' My response always was: 'How do you know I am not?' I remember, back in the 1960's, there was a book *How I Made a Million Dollars in the Stock Market*, written by a dancer, of all people. We always questioned, if this was such a great technique, then why did he share it with everybody? Well, the point is that he sold so many copies of the book – that's how became a millionaire. It wasn't the stock market that made him a millionaire. He wrote this book and he made up some sort of a box method of charting which was incredibly simple, but the book sold because there were greedy people out there who thought they could make a million dollars. So, that's a good question you just asked me. Why do guys like Wells Wilder, who worked out the stochastics discipline, or the fellow who worked out the MACD discipline (can't think of this name) share? Let's think about that. If you ask me and John Murphy and Ralph Acampora and Gail Dudack to explain how we employ the relative strength analysis, you are probably going to get four different answers, even though we are all using information that's in the public domain. People know how to calculate it, but the way that they employ it can vary. Some people will look at it as an early warning indicator, other people will look at it as a confirmation indicator as well, because it is really both. A similar argument could be made for any other indicator. So, while the indicator itself is in the public domain, the interpretation of it might be entirely different depending on who you talk to.

J: And the interpretation of it is not in the public domain?

AS: Correct. It might be in a book, like in John Murphy's book and maybe in Bruce Kamich's book. In my chapter I have a whole section on relative strength, but I may have presented it to you much differently than they did, though we are all going to teach you how to calculate a relative strength line.

J: So it seems like everything is in the public domain, not only the formula, but also the interpretation.

AS: Yes, I think so. The interpretation might be out there as well. You learn early in life how to read, but that doesn't mean you are going to read as well as the person next to you who learned at the same age. You are going to have different reading habits. You can read faster and retain better, so you are smarter. It's the same thing with these indicators and their interpretation. It's out there, but that doesn't mean that everybody is going to look at it and interpret it the same way.

J: But someone who is smart should be able to interpret the indicators successfully just the way it's presented in the literature and achieve your level of success?

AS: Exactly. And with experience you learn what you are after. When I taught my classes I used to have a "get to know each other" session during the first class. I would ask every student why they were there. One time an older gentleman said: 'I am taking this class because I am sick and tired of making contributions.' And I understood immediately what he was talking about – he had taken a couple of big losses. He called those contributions. You see, in the stock market there are only four outcomes to investing: big profit, small profit, small loss, and big loss. If you had a discipline at your side, it should prevent you from taking a big loss. Wouldn't that be great? That doesn't mean you are not going to take small losses, and maybe occasionally you'll have a small profit and a big profit. Technical analysis will prohibit you to take a big loss if you apply it properly. You can apply it with simple trendline analysis, or moving average relationships. Remember, there are only two losses that you can take: your money, or an opportunity. I'd rather be out wishing I were in than in wishing I were out. So that's how simple all this is. You could apply the basics of technical analysis with a ruler and a pencil, and I guarantee you, over your lifetime you'll never take a big loss. You'll take some small losses, but you'll never take a big loss. It's such a thrill to be out, watching a stock go down. We told clients to sell TYCO at 51 dollars, because the stock was turning. Did we know the stock was going to go to 10, and Kozlowski was going to get indicted? Of course we didn't, but our work said this was a stock we didn't want to own any more. My wife was a broker back then, and she had managed accounts. With the touch of a computer button at home, the stock was sold out of every one of those accounts at 50 dollars a share. The clients were in awe. Enron, we were out of that stock before it went to its downturn. Did we know there was a scandal, and the chairman was going to be indicted? No we didn't. But we knew the stock wasn't going up any more. So those were two huge losses that our discipline did not allow us to take. We know a lot of people who rode TYCO all the way down, didn't know any better. I am so sorry for them. Remember, if stock goes down 50 percent, what does it take to get even? A 100 percent rise!

J: Just to get back to my question: Why would you want to share your inventions with

others, rather than keeping the edge just for yourself? We've established that you basically share everything – the formula is there and then you share your own interpretation.

AS: It's only because we want the client to understand the reason behind the opinion. It's not that we share everything. I'd say that we are more in a sharing mode when we are asked to, particularly if it's a well-paying client. I think it's a legitimate question if a client comes back and says: 'How did you arrive at this conclusion?' So maybe that's going to cause us to share or necessitate that we share some of those things that you brought up, whether it's the formula or the interpretation.

J: Would you share everything with them?

AS: If they asked, I think, yes. The only way you are going to build a solid relationship is if the client knows where you are coming from.

J: Are there things that you developed but never shared with the rest of the world?

AS: I can't think of anything that I didn't share.

J: How often do you use the technical tools you developed?

AS: All the time.

5.14.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

AS: The answer to the second question is no. Hopefully as you become more experienced your ability to lose money reduces. Remember, it's that big loss that we want to avoid, so sometimes we may prematurely sell. The stock may go up a little bit more after we sold it, and the client might get mad at us, but then, if it goes down big after that, we feel good. So obviously, as our experience matured, our loss taking diminished.

J: How would you answer the first part of that question: How did you feel when you first lost a lot of money?

AS: As I told you earlier, one way we can find ourselves in a negative situation is if something happened that we have no control over. But that wouldn't really shake our confidence. It could, I suppose. Remember that example where the chairman of Teledyne announced a buy back program after we had issued a short sell recommendation. The stock went up, and we were trapped. We couldn't get out, and we had to take a loss eventually when we

covered the short. But that didn't shake our confidence in technical analysis. It could have, but it didn't. And don't ask me why, because that's a question I can't answer.

J: Has any kind of loss or any kind of tricky situation ever made you doubt the validity of technical analysis?

AS: We have never taken a big loss. We truly haven't. Any losses we have taken have, in my experience, been small ones. That precisely is an asset of the discipline. Marty Zweig is a friend of mine. He used to have many helpful sayings such as, for example, "don't fight the tape" or "don't be afraid to make a mistake, just don't compound them." That's true. You may be wrong, but if your discipline tells you that you are wrong, don't question the discipline.

J: How is the way you apply technical analysis different when you are more cautious compared to when you are less cautious?

AS: You have to think of the discipline as being a three problem approach. It's not a mechanical type thing. We are assessing the overview, we are assessing the groups, we are assessing the stocks. We can develop the overview with the help of our sector and stock work. And the overview might also be helpful in the stock and the group work, but not as helpful as the bottom up approach. So it's like constantly writing a dissertation. We are doing a lot of global work now. We are actually doing global sector work. For example, if we find that the steel group in the United States is looking strong, we check to see if the steel group in Japan is looking strong as well. Global themes enhance our US work more now than in the past when we didn't have access to global data nor the ability to simulate the studies. Nowadays we have technical analysts who work in Australia, in Europe, etc. They report in to us from their parts of the world, but we are not necessarily dictating their approaches. Obviously, our Japanese technician is very highly regarded in Japan, which is his market. He doesn't speak English, so we can't bring him over here to talk to our clients. His work is interpreted and distributed to our clients. He obviously does a lot of candlestick work, and member of our staff here has become very proficient in candlesticks. In fact, he actually teaches it in classes. Frankly, I don't understand it, but I don't have to, because I have a member of the staff who does.

J: Do you always follow the approach you just outlined regardless of how cautious you are? Is the way you apply technical tools any different when you are more cautious as opposed to when you are less cautious and willing to take on more risk? Does the style of your technical analysis differ in these two situations?

AS: I am sure it does differ.

J: How so?

AS: These are very good questions, but I am not sure that they are answerable, because it's almost like an exploration of the brain. What you are asking me really is do I let the right side speak louder than the left side. (You know how there are two sides to your brain – the left side is objective and the right side is subjective.) That's the way your question is slanted, and that's very hard to answer. I sometimes ask our trainee brokers: 'Why do you think you have a quote machine on your desk?' It's such a simple question, and they get all involved in Harvard type answers. The reason that brokers have a quote machine on their desks is because things change. The quote changes, the trend changes. One of the wonderful things about this business is that every day I'd come to work I would go to the chartroom, walk around the room, and look at the pictures. And I would do it because I knew things were changing all around me. I would ask myself: 'Is it a short term change or is it a more structural change?' That's where I had to apply my subjective reasoning more than my objective reasoning, in trying to make that judgment. Sometimes a variety of things would come up, and I'd place more emphasis on one indicator than on another. But it's hard to say exactly how many times that would happen, because it's like asking me to relive every day I walked in the chartroom or to relive every day I turned on my quote machine.

J: Do you ever decide: 'OK, now I am going to be less cautious, I am going to taking more risk'?

AS: Sure.

J: Does the style of your technical analysis change in that case in a way that you can recognize?

AS: I don't think so. I'll show you a report that I wrote in the early part of 1989, where we suggested that a new bull market leg was under way. We were not just talking about the market coming back to 3,000 or up to 3,000, we were talking about a market that could make many thousand breaks. The first two pages of that report were actually summaries of weekly pieces that we had published in prior weeks, which led us to exclaim that a new bull market leg of some stature was on the way. That was an ongoing process, each week we would build on the case. A lot of our theme pieces are the result of weekly pieces which we put together to build our case, and which we then present in a single 13-page report rather than in 13 single-page reports.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

AS: That's a good question because that's exactly what technical analysis does – it permits you to dismiss your emotions. It takes the emotion out of the equation. I remember Joe Granville once was giving a speech, and a lady got up in the back of the room, God bless

her. She talked about how her husband, who had passed away, owned General Motors and how that was his favorite stock. The stock wasn't acting well, so she asked: 'What would you do, Mr. Granville, with this investment?' He stood up there, looked at her, and said: 'Madam, I am very sorry to hear of your husband's passing, but I am going to tell you this: the stock doesn't know your husband is dead, and the stock couldn't care less your husband is dead. If you don't like the way the stock is performing, don't hold onto it just because your husband liked it or because it was his favorite stock. Sell it. Don't let your emotions get in the way because the stock doesn't know you own it.' There are people who look at the ticker, see the stock falling, and say: 'You can't go down, I own you!' The stock doesn't know that. So technical analysis permits you to immediately dismiss your emotions. That's why I said, when you walk into that chartroom on any given day, your emotions are left outside.

J: Theoretically that's what's supposed to happen, but does it really happen for you?

AS: It did. Absolutely.

J: You have always been able to perfectly separate emotions from technical analysis?

AS: Yes. I'll tell you, the difficult times were when we were negative, because no one likes to hear negative messages. And we weren't trying to say that our craft was better than other people's craft; we were simply trying to explain that the environment was in the process of changing. Unfortunately, some of our more fundamentally and economically bent colleagues were not able to accept that, and our clients suffered because some of them stayed bullish while we were bearish. The firm permitted these two points of view to go out, and then it became up to the clients to select which one to go with. Of course, we were right and our nontechnical colleagues were wrong, so our discipline was very much in demand during the difficult periods of recent years. But that was tough for us. It was hard for us to make those statements, particularly when we knew that we were not in agreement with the others. But we figured that's why we were here.

J: So your technical team was able to separate out the emotions from the analysis.

AS: Exactly.

J: Now, in your particular personal case, how has your ability to separate emotions from technical analysis changed since when you first started? Was it harder in the beginning to separate the two? Is it something you have learned over time?

AS: It's something I've learned. Yes, indeed. And, again, it comes with experience. In the beginning, all I did was keep a point and figure chart of a single stock, and look at everything that we are doing here now. All the surrounding elements have changed. It's

incredible just to think about the growth of our explorations and our explanations.

J: So, in the beginning your decisions were very much influenced by your own emotions?

AS: Yes, most of all because in those days we were simply recommending stocks. After sending out a recommendation, I'd be watching the physical evidence or the symbol crossing the ticker tape, and the emotions would maybe take over a little bit. But if that stock started to turn negative, I wouldn't let the emotions take over. Rather, I would send out a notice and say "take your profits." And that's really all we were doing in the early days – we were trading stocks. Another thing that made it a credible venture was the so-called master list that we kept. Namely, brokers had at their disposal a record of our recommendations. Every instance we recommended a stock to them, as well as every instance we recommended that they sell it, were recorded. But we never had more than 10 stocks outstanding as recommendations, so they had an opportunity to see how much profit, in percentage terms, we took on each recommendation. So we used to tabulate that, and we used to tabulate the average profit of so much percent per stock. Our brokers had all that in front of them. And that was important for us too, because we were able to quantify, if you will, the results of our recommendations.

J: In general, is the ability to separate emotions from technical analysis an inherent trait that you have to be born with, or is it something that can be learned over time?

AS: I think you can learn it. You are getting into the brain again. A good mind is like a parachute – it only works if it's open. You have to have an open mind. Take your own experience. You've probably had some skepticism about this project in the beginning. How do you feel right now about the technical analysis discipline having done all these interviews?

J: I feel more confident about it.

AS: OK, great. You feel more confident because you have an open mind, first of all, to accept what you've heard. If you came into this project with a closed mind and an attitude that this was all witchcraft and sorcery, there is no way that you'd feel more confident about it because you'd never let your mind absorb it. So that's wonderful that you feel more confident about it. And you are not going to take any one explanation, because you've been given so many inputs to go on and study. Just think of the ability you have right now to set up your own shop somewhere – you know exactly what you want to do. Wonderful.

J: So, in general, all you need is an open mind, and then you should be able to learn to separate emotions from technical analysis?

AS: I think so, yes.

J: You don't have to have a specific personality type?

AS: I think you have to have both. I really think it's both. I'll tell you this. I think I learned over the years that I have an asset that maybe no one else has. I truly believe I have a photographic memory, and that's helped me over my career. Why did I write this last piece? Because I remembered looking at a similar pattern of the market around the Dow 100 level. That intrigued me to investigate further, look at a 1,000 and a 100, and see if I could apply it to 10,000. The similarities that we've uncovered are truly incredible. So, quite frankly, I think I do have a photographic memory, and it's been very helpful over my career. But, again, I can't say for sure that I have it, but I believe I do.

J: Do you think there are people who, no matter how hard they try, just cannot learn to separate emotions from technical analysis because of their personality? In other words, is there a particular personality type that is especially incompatible with the practice of technical analysis?

AS: There could be. I have a very fascinating personal situation that's ongoing. I have a grandson who's autistic. He is now 4 years old and is coming out of his autism a little bit with special training. If, indeed, this is something that's going to go on for the rest of his life, I think I am going to be an incredible influence on his future. As you probably know, autistic children can be extremely intelligent mathematically, and this is obviously going to be a mental and psychological thing going forward, because of the preconceived condition. This little guy may be an incredible technician some day. We are all born with certain traits, but I think the open mind thing is really what's most important.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[25]*." To what extent is this statement true in your case?*

AS: Well, I think I've just lived through an interesting experience. I personally have owned, and still do quite a few thousand shares of Newmont Mining that I bought over time. I like to average up. I never average down, because that's putting good money after bad money. So I averaged up as the stock went from the 20's into the 30's on its way to 40 on its way to 50, and then I watched the stock break down and fall to the low 40's. I saw people panicking and selling, but I didn't let my emotions get in the way because I had my technical judgment. I recognized that I was in the midst of a major move rather than a short term move. And I was able to recognize that because I was able to find a stock in the past that looked just like Newmont. In fact, I was alive at that point in time, following that stock. So I made a relationship and shared it with our clients that the price pattern of Newmont mining looked a lot like the pattern of the Bowing in the early 1970's, and the latter went

[25]De la Vega, Joseph. Confusion de Confusiones. Harvard University Printing Office. Massachusetts: 1959. p. 22.

from 20 to 300. So, I have lived with my Newmont Mining for a long time now, and, in fact, I may be buying back more now as the stock appears to be reconsolidating again. I've watched other people panic or sell out – I don't like to use the word panic – because they saw that the stock started to go down. My basic view was that the weak holders were being shaken out, and that eventually the stock was going to grab and start to go back up again. I could have let my emotions take over like I guess they did with these other people, but I think it's because I have this longer term point of view that I let the shorter term atmosphere that developed just do what it had to do. I am now watching the price of gold begin to firm again, and I am sure that Newmont is going to follow through any time. When you interview John Murphy today, make sure you get with him into something he's well known for and has wrote about – intermarket analysis. That's how he calls it. He was really the first to develop the idea that one has to keep an open mind in a sense. What I am saying here is that if you are going to own Newmont Mining, because you think the stock of Newmont Mining looks attractive, you certainly want to watch the price of gold, and maybe the price of copper, the price of silver, and the price of other precious metals. So you are always looking at the intermarket relationships. Similarly, since interest rates have a bearing on the direction of the stock market, you want to have an understanding of what the interest rate trend looks like, because you know that rising interest rates generally are not good for stocks, so that will keep you extra alert on your stock market indicators. You also might want to have an understanding of what the bond market looks like. That will be a good area to get into with John.

J: Do these mini-battles of greed and fear happen often to you, or are you pretty much convinced one way or the other?

AS: It doesn't happen to me, but I can tell you that it's certainly something that's out there from the perspective of watching this happen in the form of the public or the crowd. We sit down and we stipulate, if you will, the different stages of a stock's advance. The crowd is the reason there are usually five phases of a stock advance, three of which are up and two of which are down. The first phase of a stock advance I always call the disbelief phase, and the second phase is when belief comes to the fore, because more people are understanding that there is improvement going on perhaps in the company's fundamentals. And then the last phase of the stock advance is the greed phase, and that's when everybody has got to own it. So the three up phases are: disbelief, belief, greed. In the downtrend it's the opposite: disbelief the first leg down, belief is the second leg which happens when the earnings start to fall apart, and then the stock collapses in the fear phase. This is where nobody wants to own it.

J: This is a general description of the crowd psychology. How about your personal case, how do you stay immune to these mini-battles of greed and fear that the de la Vega's quote is talking about?

AS: Because I am aware, I am a student of history. I don't get caught up in bubbles, because I've read about them, I understand them. I don't get caught up in fear at the bottom because, hopefully, I am not in at that point anyway. I get out before it comes to the fear phase.

J: So, once you reason through what you need to do, you are very confident about your decision. There is no other voice telling you to do the opposite?

AS: I try to be. At other people's suggestions I read a book called *The Crowd* by a chap called Le Bon. I read MacKay's book *Popular Delusions and the Madness of Crowds*, which taught me about the South Sea bubble, the tulip bubble, and other bubbles. So, when I think I am experiencing a bubble, I know how to handle it, as I am student of history. A good technician has got to be a student of history.

5.14.7 The role of creativity

J: What role does creativity play in technical analysis?

AS: Oh, Gosh. On a scale from 1 to 10, 10 being the highest, it's a 10. You have got to be creative in many ways, and you have got to be accepting. Creative is having the open mind. You have to be able to discern that something could be changing. The attributes of a good technician are: intelligence, open-mindedness, willingness to be a student of history, and, of course, willingness to accept change, because that's what it's all about. You have to be able to understand that something that was going up is now going down, or that it is changing from up to down. That's what the job entails. So, creativity plays a huge role.

J: Can this creativity be learned?

AS: Yes. Read my chapter on technical analysis in the *Financial Analyst's Handbook*. When you come out of reading that chapter, you'll have creativity in one way or another. Ron Daino is a good technician because he's really an artist. He studied technical analysis while he was a creative art director for Avon Products. The fact that he had that artistic creativity in him makes him a much better technician, I think.

J: Is there such a thing as an inborn "talent for technical analysis"? Could you define it?

AS: I don't know. That's such a great question. For example, in my classes I would find that some students were better than others because they had a better open mind, I guess. What I was trying to teach was readily accepted by some students and rejected by others.

J: Is there something else other than the open mind? Does this talent manifest itself in any other form?

AS: Well, it manifests itself in the form of intellect. Bob Prechter is so intelligent he is a member of Mensa, and I am sure that helped him become so astute in the Elliott Wave theory. So, intelligence plays a role in it, and that's something you are born with. And then, of course, you have got to have the ability to innovate, the ability to create, the ability to have an open mind. These are all assets which are very important.

J: Is there anything else? For example, there are some people who are not good in math, but are very talented in foreign languages and can learn 10 languages very easily. So they are very talented in that sense, though if they were to take a math class, they would not seem smart at all. So I am trying to figure out what is this talent for technical analysis. Of course you have to be intelligent, but what exactly is the talent, if it's possible to define it?

AS: These are great questions. I don't think it's possible to define it. I don't know. I mean, I fell into it. Remember, I didn't start as a technician – I started out as a fundamental analyst. I appreciate the fact that I started as a fundamental analyst, because later, as I learned about technical analysis, it enabled me to understand better that these were two different approaches.

J: Does analytical, scientific reasoning or creativity play a greater role in this talent?

AS: It's both. I think so. We had a fellow who worked for us, without names being used, who was very creative, but he wasn't able to communicate. So when it came time to downsize the staff because of company considerations and economic conditions, he was the first to go, because even though he had a great ability to be creative, he had no way to communicate. At the same time I had people who might not have been as creative but had a good ability to communicate, both orally and in written work.

J: Is there a particular personality type that's especially suitable for the practice of technical analysis?

AS: I don't know. I've worked with all kinds of personalities. One of the great assets of our group is that everybody has the ability to communicate, both in writing and orally. That's a talent, maybe. We have to give so many speeches and do so many conference calls, and having the ability to persuade is critical. So, speaking and writing abilities are very important in our business as they are in any career. But they are particularly important for us, because our main job is to communicate.

J: So what emerges is that you have to be a good communicator, both orally and in written from, you have to be analytical and have good scientific reasoning skills, and you have to be

creative in an artistic sense of a word.

AS: Yes, and I'd say it's also important not to forget your clients needs. What the client wants is always to know whether he or she should buy or sell – that's the bottom line. Sometimes you might turn the client off by being too scientific or being too technical with your reasoning. I'll tell you that over the years I tried not to make reference to a lot of the patterns by name. I mean, we don't start off by saying we are bullish because the market is making a head and shoulders bottom. We are going to start out by saying we are bullish because our technical research allows us to so interpret the pattern of supply and demand that's emerging. We don't run out and say we are bullish because there is a pennant formation forming, or something.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to completely replace a human technical analyst? If not, why not? If yes, please explain.

AS: Yes. I've seen it at work. I have a very close friend who has applied certain technical techniques to his artificial intelligence model and has run money successfully off of it. Now, I have seen this without any real scientific background. The guy is my personal friend, and he showed me the results of his work. I don't understand the first thing that goes into it. I've read books on chaos theory, I've read a lot of this stuff, but I am not that smart to understand it. But, I've probably jumped at your question too fast when I said yes. I probably should have said I think it's possible, rather than just emphatically yes.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

AS: Yes, it is capable of many interpretations. One more point though. You have to say that fundamental analysis is what you want it to be. Come on, it's the same thing. Economic analysis is what you want it to be. If they think economic analysis is a science, how can there be five economists in a room with five different opinions? Give me a break. Let's make a common platform for all forms of analysis – it's all educated guesswork, and the degree of your success is based on the degree of your education. That's the bottom line. I mean, how can all these economic interpretations of GDP, unemployment, or CPI be all over the place if it's a science?

J: So you'd say that all these forms of analysis are partly art?

AS: Yes.

J: What percentage of technical analysis is art and what percentage is science?

AS: I have no way to quantify this, but I would say that nowadays it's probably half and half. The art is the subjective interpretation of the indicator. The objective part or the science is where you have that buy or sell signal based on the back testing you've done like you saw in that one illustration in the book. That's science, because it's objective – you can say this is how it's worked in the past, and these are the probabilities of how it's going to work today.

5.14.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

AS: Good question. How do you define luck? I've never been able to define it. I had a good day the other day, even though I had a black cat walk in front of me five times. Is that luck or is it randomness? I don't know. I mean, black cats are not supposed to be good things to walk in front of you, and I saw Newmont Mining go from 20 to 40 or 50. We were long in the stock. Is that luck or is it talent? I don't know. Someone actually sent me a rainbow – I don't know if it's still on the chartroom wall – and the end of the rainbow comes into a pot of gold, and he wrote Newmont on the pot. Now, was that an expression of luck, because there is supposed to be a pot of gold at the end of the rainbow? Sometimes, after a good day, I might go home and say: 'I feel lucky.' But that is probably not the proper thing to say, because I certainly would not think of luck as playing a role in my success, but it might have been partly that. I don't know how you can quantify luck.

J: In any case, it's not a major factor?

AS: Oh no. Not at all.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

AS: Yes, I do. I know Arch Crawford very well as a person. He is the main advocate of astrology. I am not an astrologer, but I would say that simply the fact that astrology is akin to hocus-pocus in people's minds is probably something that does discredit the craft a bit. But, by the same token, I am speaking to you as a non-astrologer. Maybe if I knew more about it, I'd think differently. I realize that the Gann analysis applies some concepts of astrology in its work. I've seen some copies of the Gann work, and I walked away completely astonished. And I am a student of Nostradamus, and I know he relied on astrology a bit when he made his prophecies. But, of course, astrology is a discrediting factor just because in other people's minds astrology is akin to witchcraft and palm reading. They don't know Arch Crawford personally like I do to realize that he is a credible individual who means well. But, again, if all of us who discredit it learned more about it, we would possibly see that there is a fit somewhere. Would I take it on as my main input? Probably not.

But thank God he is out there. He is someone that we can either be amused by or learn from.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. are the governing laws that underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

AS: I'll give you my opinion. It's a combination of things. I knew Bob Prechter when he worked for Bob Farrell and started emphasizing the Elliott Wave work in his writings at Merrill Lynch. He was very well accepted with it. He then coauthored a book with Mr. Frost, went out on his own, and became a millionaire with the Elliott Wave Theorist newsletter. He was right for a good period of his calls. He was deadly wrong for a few of them, too. I don't think he really admitted up to when he was wrong, which is bad. But anyhow, the point of the matter is that I have indeed studied the spiral and I studied the angle of the pyramids, and I am very much taken aback by the ratio of 6-1-8. In technical analysis, based on some of the classic theories we have 1/3 and 2/3 retracements that are acceptable of a major move. Now, those theories had been put in place long before the Elliott Wave Fibonacci sequences. But what is a 2/3 reversal? It's a 66 percent. It's close enough to 6-1-8, isn't it? So, as the Elliott Wave method became more understandable to us, we found that we were already applying some of its principles with Charles Dow's work, accepting a 1/3 to 2/3 or a 50 percent as a normal retracement of a move. So I think it's the stuff you want to be aware of. The Elliott Wave theory does pivot off of the discovery, the belief, and the greed phases, and then tries to subject them to subminuets, minuets, cycles, grand supercycles, etc. Having at least the knowledge of that is helpful. Let me tell you about some stuff that we've done that no one else I've seen has done. Namely, we created certain filter charts of the market, which allow us to look at the market on a little bit more of a longer term basis. You can see an example of that here in this book. This is a filter chart of the Dow Jones Industrial Average, from its inception in 1885 right up to the present. Only moves that are 10 percent or more are represented on this graph. So, given that a secular bull market did begin in 1932, you can count the legs – 1,2,3,4,5 – they are so prominent. This is why Prechter is looking for a significant down still to come. I mean, there is 1929 and 1932, and this is all that's happened so far (*pointing to the chart*), yet the press has made a big deal out of it. If we had a percentage decline as this one, the DJIA would be down here somewhere (*pointing to the chart*), which I am sorry to say is 2000. But, you know, that's in the back of my mind. I am not emphasizing that thought process based on the Elliott Wave work, but isn't it interesting how we can overlay the Elliott Wave work onto that big picture, because we have this study at our disposal? And you can see the small 1,2,3,4,5's as part of the first leg. So, yes, I respect it. Do I practice it wholly? Of course not. I respect Gann analysis. Do I practice it wholly? No. It's a thought process that might come into the final opinion.

J: So you respect it, but are you truly convinced that these theories are the underlying

laws of the market?

AS: It's there. It's not a 100 percent governing principle, because I don't know what the governing principle is, except that there is greed and fear at each end of the equation and that it's human psychology that takes us there.

5.14.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

AS: Yes.

J: Always?

AS: Always.

J: Even in the earliest days of your career?

AS: Look at the way I started. How did I get involved? I saw it work. I followed what the charts were saying in 1961, and I avoided the 50 percent declines of 1962. And remember, the earnings didn't change – it was the PE that changed, going from 47 to 20, and the stock went down 50 percent to allow that to happen. So that to me was what turned me on to the approach. There was validity in separating the company from its stock.

J: Did you become more or less convinced since when you first started?

AS: More. Absolutely.

J: Because you've seen it working?

AS: Yes. Absolutely.

J: Did the lack of credit many academics give to technical analysis ever discourage you?

AS: It never discouraged me – it encouraged me! It encouraged me to educate them and hopefully make them more aware that they shouldn't just repeat what other people say. They should find out for themselves what it's all about. It's interesting that in the financial classroom so to speak, in the investment management classroom, the subject was never really approached. But it never discouraged me. It probably encouraged me.

J: The opinion of the academics has never shaken your confidence in technical analysis?

AS: No, because I never saw anything credible there. It was all here-say. And, to have been subjected to that trick only encouraged me more. Here was an academic who was trying to trick us by sending us randomly drawn charts so that he could prove it was witchcraft or whatever. But I was smart enough to recognize that those were randomly drawn charts. Now, did he ever publish that as a paper saying 'my research failed because these guys didn't fall for my trick'? No, he didn't publish it.

J: What, in your opinion, is the best proof of the validity of technical analysis?

AS: Well, my successful career. How would I have had a successful career if I was constantly advising people about things that went wrong? The great success of our model over a period of time shows that the application of our technical disciplines would allow one to significantly outperform the S&P500 if they follow the discipline. Looking at historical data, we are able to show our clients what sectors we were overweighted in and what sectors we were underweighted in at any given point in time – that gives our clients an understanding of how the technical discipline might fit in with the fundamental advice that they are receiving.

J: Did you find that your experience with technical analysis contradicted statements made in the technical analysis literature? Did that ever discourage you?

AS: You mean my learning literature?

J: Yes.

AS: Maybe occasionally. I can't come up with an instance.

J: Did such contradictions discourage you when you noticed them?

AS: No. But, you know, a good related question would be: 'Did you ever find that technical analysis disagreed with other disciplines that were being performed?' The answer to that question is definitely yes. That's what I was getting at when I told you how we were bearish on TYCO, while the analysts were still bullish. And there were times when we had an economic outlook that was completely different from out technical analysis market outlook. But those things did not discourage me.

J: Even if your own experience contradicted something that was stated in credible technical analysis classics, you did not get discouraged?

AS: It probably encouraged me to find out why we had a disagreement. I can't come up with an instance unfortunately where that might have happened, but I am sure it did.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven

theories ever bother you?

AS: I disagree with that wholeheartedly that there are no proven theories. If you wanted to take the time, you could go back and find instances where the companies that make the goods and the companies that transport the goods moved in confirmation in either direction and signaled an oncoming trend, and that's the Dow Theory. You could go back in history and find that, indeed, when the army started retreating while the generals continued to advance, the generals eventually followed the direction of the army. We have it right in that book, all the way back to 1927. You can take the time to look at the advance-decline line versus the Dow Jones average above it – that theory can be proven I'd say accurately.

J: So you would say that there are hard and fast rules in the practice of technical analysis?

AS: Yes, it can be very rigorous, which is the academic term people like to use.

J: Do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

AS: I was written up in a book called *Investment Analysis and Portfolio Management* by Cohen and Zinbarg, which is in its third edition right now. There is a section in it on technical analysis in which the authors cite a 1966 Business Week article where I was quoted along with five other technicians. There were six different opinions in that article, and one of them was right (me). Their conclusion was, technical analysis is not the method, it's the man. They arrived at that conclusion because six technicians supposedly looking at the same stuff arrived at six different opinions. So that's one way that you can maybe conclude like these guys did. The method is like the balance sheet, remember. Put a balance sheet in front of five CFA's and you might find five different opinions by the end of the day.

J: Getting back to my question, considering technical patterns and indicators ...

AS: I understand. Again, it comes down particularly to trend analysis. Oftentimes, when our economist is sending his pictures around the room, if I see the trend of housing stocks breaking down, I'll pull out my ruler and my pencil right there. They'll all kind of chuckle at me, because I'll be starting to draw trendlines on capacity utilization or GDP numbers and thing like that. But I'll hold it up to them and say: 'Well, this doesn't look very happy, does it?' [My colleague] Louise [Yamada] is fun to listen to when it comes to this – she talks about the smiles and the frowns. The smile is happy and the frown is negative. So I'll show them a picture of some economic indicator and say 'now this doesn't look very happy, does it?' They'll chuckle a bit, but they'll understand what I am talking about. Whatever it is, it's breaking its uptrend, it may be housing starts, or whatever.

J: Would it be sensible to apply technical indicator to the weather data or the river flow

data?

AS: The weather data? I don't think so, because that's unpredictable. It's more unpredictable than the stock market – they still can't forecast hurricanes or tornados accurately.

J: If you plotted river flow data on a piece of paper, would it be sensible to draw trendlines, look for head and shoulders, and things like that?

AS: No, it would not make sense to look for head and shoulders and all that, no. But trendlines might be helpful.

J: Why not head and shoulders?

AS: Because that's a pattern created by forces of supply and demand. That's the important thing that we have to start with. Technical analysis deals with the forces of supply and demand which are reflected in price, and the extraneous factors like volume, momentum, relative strength, overbought-oversold, etc. are all based on price.

J: Are most of the technical indicators designed to capture supply and demand properties of the market action data, so that they would not work if applied to the natural phenomena data?

AS: Maybe momentum would work in some cases, because it's measuring acceleration and deceleration. You can even think of a car. What do you have in car besides a speedometer? You have a tachometer, an RPM, which tells you whether your engine is gaining or losing momentum. Obviously, if the meter starts to go down, you are losing momentum and the car is slowing down.

5.14.10 Lifestyle

J: I know you are retired now, but could you please recall and describe your typical working day?

AS: Sure. A working day would typically start with an assessment of the environment, which is everything around us. We would have writing assignments every week and our conference call every Thursday at 4 o'clock with 14,000 brokers. So, lots of our working days would be pre-planned because they were in a programmed state. A great deal of our time would be spent in communication. I traveled a lot. I would be out of the office maybe 3 or 4 months a year, always communicating. If I went to the west coast, or if I ever went west of the Mississippi, that was at least a week's trip. We would stop at Portland, Oregon visiting clients, and end up in San Diego. Or I'd spend two and a half weeks in Europe. I used to say that that was a one month trip, because it took a week to get ready for, two weeks to

do, and a week to get over. We also have clients in Singapore, so I'd go there as well. So, travel was a big part of my job. I was always communicating our thoughts to our clients, domestically and internationally. I used to love to travel, not so much to see the geography – most of that was out of the window of a taxi, anyway – but because I'd pick up ideas from the clients. Clients would ask questions that would give me ideas about new things to work on. I'd always be asking how we could improve our service to the clients. Some of their suggestions would be mechanical, regarding the design of a particular product, rather than intellectual. And, of course, we had our policy meetings I had to go to. So, part of my job was creative, and part of it was spent in the process of communication. I'd say it was 50-50, with communications at all times being the most important part of the job. A lot of our communication is now electronic, which makes a lot of things easier for us to do.

J: How many hours each day would you spend practicing technical analysis?

AS: A 100 percent of my day was spent in technical analysis. Whether it was research or communications, it would always be about technical analysis.

J: How long was your day then?

AS: I'd be in no later than 8 (earlier if we had meetings in the morning), and I'd stay here till 5 or 6.

J: How about weekends?

AS: At the end of my career, in the last 2 to 4 years, I worked Sundays for 5 hours on our group work; [my colleague] Louise [Yamada] did too, and we would communicate by fax. Because of the data availability – a Thursday vs. a Wednesday enabled us capture more of the week – we had fed-exes delivered to our homes on Saturday. They were the studies that we would pour over on Sunday usually. So, we'd come in Monday morning with the group work already done, with the "buy, hold, avoid, sell list" already created, and that would enable us on Monday to make changes in the model based on that "buy, hold, avoid, sell list." If you were to ask our clients – 'What do you most value at Smith Barney technical research?' – their answer would be – 'their sector work.' I always think of the overview as the entertaining part of the business – it presents what you think of the market as you are going up or down. The most valuable part of what we do is our sector work, with the stock work supporting it, of course. And, of course, weekends would come into play when I was traveling. On that trip to Portland I would not leave Monday morning – I'd usually leave Sunday afternoon so that I'd be there Monday morning.

J: Is the market always on your mind, even if you are just relaxing on your vacation?

AS: Oh yes, sure. I can remember being on a beach in 1982 and the stock market started

to advance. Right prior to that I was subject to an interview in Barron's magazine which was very bullish, looking for a strong market advance. And I finally took some time off, I was on a beach, listening to radio, and a market had closed up a 100 points or something. It was still around 900, it hadn't broken to a 1,000 yet, but it was working its way up there and I felt very excited about that because I was just written up in this magazine taking that stance. But, you are right, the market is always on your mind.

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

AS: That's an interesting question as well. I think there is always going to be stress. And remember again, it's not technical analysis that's forecasting the move. Technical analysis is allowing us to develop a mindset. That's the easiest way that I can explain what our discipline permits you to do. It's not the discipline that's forecasting, it's us who are forecasting. The discipline allows us to develop a mindset, to lay out a battle plan. It's the day-to-day market action thereafter that we asses to see if it is fitting into the mindset of the battle plan. When it does, it's very gratifying, and when it doesn't, we try to find out why. The stress comes into play when the mindset is not being fulfilled. Right now I have a little stress about this piece we did, but it's not keeping me at work at night, believe me, because I am not coming to work any more. But if 16 years from now I am still alive, and I see that the market did not go much above 10,000, and that there were those five cyclical bull and bear markets, I am not going to lean back and say: 'See, I told you so.' I am going to say to myself: 'How gratifying that piece of research must have been to some people who were able to take it and use it as a mindset piece, and who therefore were prepared.' One of my friends is a chap by the name of Jeremy Siegel, only because we used to lecture together at Wharton. He is a professor down there. He wrote a book *Stocks for the Long Run.* And it's true, you used to be able to buy stocks for the long term. My mindset now is that we are more in a trading market like we were in the sixties, the seventies, and the teens and the twenties. And therefore I am happy because right now we have a lot of chart patterns that look good on individual stocks. [My colleague] Louise [Yamada] feels a little uptight about her market call. I told her not to feel uptight about her market call but to emphasize the stocks, because that's what we did in the 60's and the 70's. We really didn't care about the trend of the market that much. But if we were able to find a 30 dollar stock that looked like it was going to break out and go to 40 or 45, we put that notice out there and clients made money in that stock – that's how we existed in that period. We weren't really all that involved with market timing per say.

J: So technical analysis, by providing a mindset for you, helps reduce the stress, but does not eliminate it completely.

AS: That's right, not completely. Oh, no. Stress is always going to be there. Like right now, if all of a sudden market started climbing to 12,000, that obviously would be saying

that our research is worthless at this point. But if that happened, we would have to step up and say: 'Remember that piece of research that we published in the early 2004, which tried to make a case that maybe 10,000 is going to prove to be a barrier that 1,000 and 100 were? That research is no longer applicable.' We'll do that if we have to.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[26].

Would you agree with de la Vega? To what extent does your trading control your life?

AS: I have a new life in my retired state. A fellow who has taken a lot of my classes is begging me to teach another class in the fall, and, frankly, I have no interest.

J: Did you have to work at creating balance, or is it something that naturally happened for you?

AS: I think it just naturally happened for me, because I had a reason to go home. I had a good balanced life, I think. I traveled a lot. My boys will remember that. They'll remember more the time that I wasn't there at the soccer game or something because I had to do the work. But that's a normal thing that happens whether you are a technical analysis or a hard working person in any profession, isn't it?

5.14.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

AS: That's a good question. I'll tell you about my own personal experience. I flunked out of college. I went to a school called Susquehanna University for one year, and I didn't do very well, so they told my parents they thought maybe I'd be better off doing something else rather than wasting their money. I did that something else. I went to school at night, which was very difficult, and I almost got enough credits to get a degree. (But I didn't get it, because I never completed all the requirements.) However, as a recognition of my accomplishments in life, Susquehanna University awarded me an honorary Doctor of Arts degree two years ago, which I am very proud of, as I am sure it took a lot of investigation

[26]De la Vega, Joseph. Confusion de Confusiones. Harvard University Printing Office; Massachusetts: 1959. p. 22.

on their part to see whether or not I was worthy of that honor. So you can correctly call me Dr. Shaw. But I'd say if you a flare for figures, that's going to be important, and I luckily do have that, even though I didn't prove it in my accounting class. But I was on the honor roll in high school – I proved it there. I think you have to be mathematically inclined, and you also have to be somewhat historically inclined, because obviously the market history is so important to have knowledge of. And then, of course, you have to take classes in English, in writing, and maybe in speaking, but a lot of it just came naturally to me. I was always a ham. I've never had problems with public speaking. I've appeared in front of thousands of people in audiences. I am always shaking my leg before I get up there, but that's the adrenaline beginning to run. I used to love it – the larger the audience, the more enjoyable it was to me. So there are a lot of talents you have to have, like in any job. But I do think that having a flare for figures is particularly important. I actually used to enjoy calculating those relative strength ratios on my slide rule, and posting the red line as the relative strength and the blue line as the price, because I was watching this trend develop every calculation I made. I think I do have a flare for figures.

J: In terms of formal education, what would be the best subject to major in?

AS: Major in investments, if there is such a major. Certainly, accounting would be helpful. Getting an MBA or the equivalent of is also important – nowadays that's mandatory to get a job, any job, in the brokerage business. Once you read through and study my chapter in the Financial Analyst's Handbook, as an example, you'll see all the things that are involved. I mentioned to you Ron Daino's case – he was an artist. But what do we do, why do we have pictures? So if you are an artist, that's going to be helpful, isn't it?

J: What advice would you give to technical analysis students? What is the key to success?

AS: The ability to first recognize mistakes, and then understand why these mistakes were made so that you don't make them again, is important. That open mind thing keeps coming back to me, and that has to do with the mistake recognition. Just because it's your research or your report, it doesn't mean that the market can't prove you wrong. We have a saying that stock market is man's only creation that humbles him the most. If that statement is always remembered, I think you will be successful. The market will always humble you, try not to let it humiliate you. There is a difference.

J: Is there anything else you would like to add that was not addressed in the interview?

AS: I think everything has come out at appropriate time, and I enjoyed going through it with you.

J: Thank you, I enjoyed interviewing you very much as well.

5.15 An Interview with Anthony Tabell

5.15.1 The early days

J: When did you first get interested in technical analysis? What first triggered your interest? Did someone or something in particular inspire you?

AT: It would be useful if we go into a bit of the history of my family and my father, because I got involved with technical analysis when I went to work for my father, and he had been involved in technical work since the early 1930's. He would come home with a portfolio of charts almost every night as I was growing up. My mother's uncle was Richard D. Wyckoff and he gave a job to my father in the 1930's – that's how my father got started in technical analysis. We all stand on the shoulders of our predecessors. When I went to work with my father, he had just broken the ice as far as getting technical analysis accepted by some institutional investors. He was running a brokerage business and was serving a number of institutions. I joined him in 1954. What I did is build on what he had done before.

So let me first tell you about my recollections regarding my father. Here we go all the way back to 1930, which was a year before I was born. My father had dreams of being a professional actor, but the depression hit, jobs became hard to get, so he decided that he could use a full-time job. He got a job with Richard D. Wyckoff at the Magazine of Wall Street. Wyckoff, of course, had done a lot of work with point and figure charts, which, right through my retirement, were the basic tool that I used. In any case, my father didn't last long with Wyckoff (nobody lasted long with Wyckoff), but he lasted long enough to develop an interest in technical work. He then worked for a brokerage firm for many years as a conventional registered representative. During all of this time, he was building up a library of point and figure charts, which, by the time you got to the mid-1940's, was probably one of the few complete libraries of point and figure charts available on the Street. This was his basic research input in conducting his brokerage business. He then conceived the idea that there was a future in the institutional business, that you could convince institutional investors to use technical analysis. So, gradually, he developed a set of contacts. By the mid-1950's, when I joined him, his business was basically institutional. But, all of his career, going back to the 1930's, he had been building up this library of point and figure charts, first with a firm called Alexander Eisman, which is long defunct. He was also a quite important research input at DuPont, and from there he went to Walston and Co. in 1948. All of this time, he was one of a small group of people that were devoting as much time as they could to technical analysis on the Street. They were keeping the torch of technical analysis alive. It's hard to visualize unless you've talked to people who were involved how difficult this was in the atmosphere of 1930's and 1940's. The entire brokerage business was a basket case. Volume on the NYSE was under a million shares. This was the 1930's, the great depression, nobody had any money, and if they did, they were very leery about investing. Furthermore, technical analysis had been associated with the excesses of the 1920's. All of the various Securities Acts were designed to get rid of the manipulative market operations that had characterized the 20's. Since technical work, to a great degree, (certainly point and figure

charts) had been originally conceived as a means of detecting pool operations, confessing that you were involved in technical work at that point was sort of equivalent to confessing that you were some kind of a low level criminal. I saw some of this, because the remainder of this attitude was still kicking around when I started in the business in the 1950's, but I can imagine how incredible it must have been in the 30's and 40's.

My father and a tiny group of other people were trying to make this business respectable. You think that later on you have a hard time with the University of Chicago, Eugene Fama, and the Random Walk Hypothesis, but 30 years before the academics even got hold of it, technical analysis was regarded very much as a low-life sort of occupation. This was the background that I started with. Going back to the 30's and 40's, my father would bring charts home. Around the time I was 8 or 9 years old, he taught me how to post charts. We are dealing here with a pre-computer age, we are dealing here with 5000 pieces of paper, and somebody with a hand pen had to make marks on these charts every day. So I was working on this even as a kid. I lived with this as part of my family. I went though grammar school, prep school, then college (Colgate University). When I graduated from college in 1952, it was the time of the Korean War, so I spent 2 years in the army, getting out in March of 1954.

Over the years my father had been bringing up the subject of my working for him and carrying on the work that he was doing. I had been reluctant to say that I would do this all through high school and college. Finally, he leaned on me fairly hard when I was in the service, and I made a decision when I left the service to work for my father, who at that point was a senior registered representative in Walston and Co. at 35 Wall Street in New York. So when I started working, I was in the brokerage business. Here again you have to understand that nobody really particularly cared about technical analysis per se. The reason my father's business was tremendously successful was simple – he was a large producer. He was successful in using this and helping first individuals and then institutional investors. His stature at that point was due to a very simple fact – it was the bottom line. Nobody that he worked for and that I subsequently worked for ever really cared about technical analysis per se. The only major thing they were interested in was if technical analysis was enabling us to produce a lot of commissions. So I was in a brokerage business that was based on technical analysis, and 95 percent of that was point and figure charts.

J: So you were practicing technical analysis all the time at that point?

AT: Yes, yes.

J: How old were you?

AT: I was 23. By this point the technical analysis component of what we did had become very important. We had probably one of only 2 or 3 complete sets of point and figure charts covering both the NYSE and the AMEX – that was our major input. (Nobody knew what Nasdaq was at that time, and there was also some doubt whether point and figure charts

would have been any good on Nasdaq stocks, because at that point over-the-counter stocks tended to fluctuate back and forth because of large dealer spreads – often a point or more. So when we are talking about a complete set of charts, we are talking about the entire NYSE and the entire AMEX.) We were doing some other stuff, such as oscillators, as well as time series sort of thing (note that in point-and-figure charts, time is not a variable). At that point we were carrying on a business that was split 50-50 between individuals and institutions, and the major research import to this was technical work.

I should also add that in 1946, my father started publishing a market letter which was based essentially on technical work. Luckily he worked for a firm at that point – DuPont and then Walston – that would put their name on a letter that was based on technical analysis. This was a major breakthrough. I started writing the letter occasionally shortly after I came to work for him in the mid-50's, took it over on his death, and continued up until my retirement.

J: In the process of learning technical analysis, did you learn mostly from books, or by doing?

AT: I learned by doing. This is not to say I didn't read, but we are talking now the 1950's. Reading a book – what book? There were how many? Six or eight. As far as point and figure was concerned, the existing bible that was still being continuously published at that point was something called *Study Helps in Point and Figure Technique*, written by Alexander Wheelan, which was published by a firm called Morgan, Rogers, and Roberts. Let me also mention, since this is all part of the early history of technical analysis, that Morgan, Rogers, and Roberts was a basic source for the posting of point and figure charts, because in order to create a point and figure chart, you needed to have a record of every tick that took place. Open-high-low-close was not enough. You basically needed to go back to the tick by tick analysis because what you were drawing on a point and figure chart were fluctuations of some number of points – half a point, a point, 2 points, whatever – but you were charting point fluctuations irrespective of time. Morgan, Rogers, and Roberts was making a living for itself simply by going into the record of trade by trade action of the NYSE. They produced by about 8 o'clock every evening the listing of all the fluctuations of X amount that had taken place on the major stocks that had come from the exchanges during the day.

So, in addition to Wheelan's *Study Helps in Point-and-Figure Technique*, I read Shabacker, and there had been various courses, including my great-uncle's Richard D. Wyckoff's course and Harold Gartley's course.

J: Did you find their courses more useful than what you were learning form your farther?

AT: I had family pride, so I believed that my father knew more about technical analysis than Gartley or Wyckoff or anybody else in the business. So when I was learning, I was learning from my father. The only reason I brought up these books/courses is to demonstrate that there wasn't much reading you could do. If I had said to you in 1940's to sit down

and read about technical analysis and learn it, you couldn't have done it simply because there weren't that many books. To the extent that there were books that would occasionally detour into technical analysis, they were like Wyckoff's books, where Wyckoff would spend most of his time telling war stories of all the wonderful things he did on Wall Street and occasionally mention the fact that he kept a series of charts. The published material was few and far between, and if I really wanted to learn technical analysis, I had to learn it from my father.

J: How much time did you spend learning technical analysis before you felt prepared to use it with real money?

AT: Again, you have to define real money. I wasn't using it with real money because I didn't have any real money. To the extent that I was using it to advise clients, I was doing that from day one. Obviously, the first day I walked in, I pretty much checked with my father on everything that I did. But I was using technical analysis in a practical sense from 6 months after I walked in the door, because I had to go through a 6-month training program first, moving around though all the various department of Walston and Company. The day I completed the 6-month training program, I took the exam, and became a registered representative. At that point I became qualified to give advice to anybody who was stupid enough to listen to me.

J: When did you actually stop checking your decisions with your father? I am wondering how much practice did it take you to become confident in your execution of technical analysis?

AT: I became reasonably confident within a year of when I started. Technical analysis was pretty low-tech at that point. Feeling confident meant that I could look at the point and figure charts and confidently render an opinion as to what the stock might do. So I was exposed to technical analysis all my life, but when I started worked I started learning it more intensely.

J: Where there things that you never saw in literature or heard from your father, but that you only learned after you started applying technical analysis to real (your own or your client's) money?

AT: I think I know where you are getting at, and by response is, I learned from the application as I went along, and I am continually improving and learning. I have become better and better in analyzing point and figure patterns. My father and I as a team continued to be better in analyzing point and figure patterns, because he was still learning too. The only time I felt totally on my own was when my father died in 1965, and that was another major watershed for me. I went to work for my father in 1954 and I worked for him for 11 years (1954-1965), then in 1965 he dropped dead of a heart attack in a client's office in Nashville, Tennessee. So there I was. In 1965 I was 34 years old, I was obviously a junior partner in an ongoing operation, and the question was, could I continue the operation, could I continue

to carry on the technical research based brokerage business, which is what my father and I together had been doing up until 1965? The answer is, I was able to convince myself after a while that I could.

J: Has your practice of technical analysis changed significantly since the death of your father?

AT: Before my father died, one of the things that moved me personally was the use of the computer. This was in the late 50's, early 60's. This was on one level simply because I like computers. I liked sitting down and writing computer programs in assembly language. But it was a natural marriage with what I was doing with technical analysis, because technical analysis is analysis of data. I can tell you a whole bunch of stories about fighting my way through Wall Street in my efforts to merge computers with the practice of technical analysis. The whole idea of doing research on these was foreign to everyone involved with technical analysis. I am probably one of the first people who tried to evaluate stock price returns on a computer, necessarily a mainframe. The PC was 25 years in the future.

So this was an interest that I developed, and the one that I pursued. I was doing it when my father was still alive, but I got involved in it more deeply when we started our own firm in 1970 after my father had died. I went out and bought a Digital Equipment PDP-11. This was a relatively modern machine compared to some of the early ones that I worked on, but this was to my knowledge the first computer to be 100 percent devoted to doing technical research. The only reason I bring this up at the moment is to help you understand why I regard the computer as a watershed in technical analysis, very much the way the steam engine was a watershed in industry. Technical analysis prior to computers was not the same. So if there was anything that has moved me in my own career, it's having been involved in this transition from numbers being written down on a yellow legal pad to the sophisticated databases.

J: You mentioned that Richard D. Wyckoff was your great uncle?

AT: Yes, he was my great uncle. I of course never met him, he died when I was still 6 to 7 years old. If I ever met him, I don't recall meeting him. My father's relationship with Richard D. Wyckoff was significant. My father learned a great deal from Mr. Wyckoff, and I in turn learned a great deal from him. Wyckoff was a generation before my father. He was my father's mentor, and my father was my mentor.

J: Which mistake did you learn the most from?

AT: I couldn't point to just one mistake. I made many. Something that I had to revise as I went along in this business was a feeling that technical work was a be-all and an end-all. What we were trying to do at this stage of the game was to go out and convince institutional investors, the professional money managers (in the 1950's you were just getting to the point where the professional money manager was attaining a god-like status that he's held ever

since), that technical analysis was a tool they could use. Both my father and I developed a fair amount of humility after a while. We had to go up to these people and say: "Certainly you as money managers will continue to use the fundamental tools you've been using all along, but here we are offering you another tool to go along with your fundamental work." I have always had the view that when you get to the bottom line, what you are dealing with is the management of money. It's the question of which tools you use and in which proportion you use them to manage that money. I have always had the attitude that what I do is technical analysis and that I am not a money manager. At the tail end, the last 22 years, of my career, I was working as part of a money management firm with money managers, but I've never in my life said, "I am going to plug a bunch of numbers into a computer, spin them around and come up with something that's going to give buy or sell decisions." I simply said to the money managers I was dealing with: "You are managing money to perform against a certain standard, and I am a specialist in a particular tool that you can use."

So I can't say that there was one thing I did and all of a sudden a bright light went on. I learned as I went along, and God knows I made mistakes.

5.15.2 Personal style

J: Could you describe your own distinct style of technical analysis?

AT: We've just been through what my father and I did with the point and figure charts in the 1930's, 1940's, and so on. Throughout my career, the major way in which I looked at individual securities was via point and figure charts. This is what my father had started doing in 1930. He was still doing it when I went with him in 1954, and I started doing it on my own when he died in 1965. I continued to do it in the 1970's when I started my own firm now with money managers, and I was doing it in 1993 when I retired. So never at any time during this entire period of 60 years between my father and myself did we stop keeping point and figure charts. Once my father had build up a complete set of point and figure charts, never at any time did we fail to have a complete set of point and figure charts. The last thing I did before I retired in 1993 was to finally after all these years get these charts off of paper, and get them onto a computer, where they still exist. If you ask anybody in the business what they associate Tony Tabell or the name Tabell with, the answer will be point and figure charts.

Now, does that say that we were relying exclusively on point and figure charts? The answer is, no, we were not. As time went on, the available techniques of technical analysis expanded. All manner of research work was being done. People like Sedege Coppock and George Chestnutt were doing work on relative strength, and you were beginning to get various smoothing techniques starting with elementary things like 200-day moving averages. My view was that I was a technician, so you name it, I was doing it.

I've been out of the business now for 11 years, I don't think I could sit myself down now to the extent that I was doing in the 80's and the 90's, and say to myself, "I am a technician, you name anything that has to do with technical analysis and I can talk about it." I could

do it to a degree, but I am not as familiar with the techniques that have been developed over the last decade. My job for the 40 years that I was working with it was to take this inflow of data – the whole series of stock prices streaming off the ticker tape 6 or 7 hours a day, use it as an input, and come out with a set of recommendations and comments that would be useful to money managers. So the answer to your question is that throughout my career I've viewed myself as an all-encompassing technician. The point and figure part was important because that's what I did more than anything else.

J: How much of what you learn from others do you directly apply in your analysis?

AT: Anything I learned, any sort of technical indicator that anybody came up with, I would evaluate and try to decide whether or not it was useful. There was the odd thing that I threw out, because I thought it was not a sensible was of looking at thing. To give you an example, I threw out Gann fairly early. But anything that I evaluated and found useful, yes, I tried to use.

J: How do you learn what works for you and what does not, without making big losses?

AT: Again, because of the fact that I am dealing with money managers and that I am not a money manager, the loss is something that the guy over there has to worry about. The way I learn is simply by keeping a record of recommendations. From day one, I've had a written opinion on every stock on the NYSE, AMEX, and later Nasdaq. It's pretty easy for me to go back and check whether my written opinions were right or wrong, and to try to figure out why they were right or wrong.

J: Is your analysis more effective when you are working by yourself or when you are working with others?

AT: I would say that it is more effective when it bounces off other people. I was always a part of the team; until 1965 I was a junior member of that team, after that I was a senior member. But, I've never taken the attitude that I was a genius. I work with other people, and we check ideas back and forth.

J: How large was your team?

AT: Eight or ten were in charge of technical work at the peak.

J: Was every person specializing in a different thing?

AT: Everyone was doing pretty much the same kind of work I was doing.

J: Who made the final decision?

AT: If a final decision had to be made, I made it.

J: In general, is technical analysis better done working individually or in teams?

AT: I don't think you can generalize. John Magee, one of the fathers of technical analysis, sat in a cellar in Springfield, MA, and worked all by himself. That worked for him, it may not work for other people.

J: In what kind of market conditions do you make most mistakes?

AT: By definition, the easiest time to make an important mistake is a major turning point. If I am somewhere in the middle of a major bull market, I may make mistakes in that my clients could have made even more money if they had listened to someone else. The serious mistake is going to occur in an environment like August through October of 1982. So you make mistakes all the time, but there are times when these mistakes will cost you a lot more, and that's at a major turning point.

J: How much of what you do are you willing to share with others?

AT: 100 percent. I was one of the founding members of the MTA, and the basic philosophy of the MTA is that we are sharing technique. I have no use whatsoever for the guy who says, "I will buy when the blue line crosses the purple line and sell when the red line crosses the green line." Everything that I do is 100 percent transparent.

J: If all patterns/indicators/strategies that you use are in the public domain, what is it about the way you use these tools that accounts for your superior returns?

AT: I wouldn't even claim that I've had superior success. I've had success. The cardiac surgeon that administered a triple bypass to me 19 years ago was using techniques that were in the public domain, but he was successful. I am still here 19 years later because he was a good cardiac surgeon. He didn't have any secrets that he was hiding from the rest of the medical profession. Same thing here. I am very much anti-secrets. I don't believe in secrets.

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

AT: You have to use a whole bunch of instruments with varying sensitivity. Market environment is important, so I am looking at a number of indicators. If the market has been going down for a year, I am looking obviously for a short term indicator to reach a deep oversold position. I don't really think about the pure random noise concept in those terms. I simply say: OK, the market has been going down for 6 months or a year, and we are looking

for a bottom, so we are looking for a given oscillator to reach a bottom down here someplace, because of the environment we are in; if we were in a different kind of environment, I would expect the exact same oscillator to bottom somewhere else. In other words, I've always found it useful to vary sensitivity or use indicators of varying sensitivity. If I am using an indicator that is particularly sensitive to random noise, obviously I am looking for more of a confirmation.

J: Is technical analysis more effective when used on its own, or when combined with fundamental or some other kinds of analysis?

AT: Obviously when it's combined. I've never been involved in using technical analysis on its own; I've been trying to get other people to use it in conjunction with whatever else in their arsenal, and in most cases that's fundamental analysis.

J: What do you do when technical and fundamental analyses give you opposite signals? How do you effectively combine the two in such situations? Do you then put more emphasis on technical analysis?

AT: First you have to define what a signal is. I'll give you an example. What I did in the latter part of my career is I took every stock and I ranked it 1 through 5, one being the best and 5 being the worst. This ranking was done subjectively according to the technical work. If a money manager came to me and said he wanted to buy a stock which was a 5, I would say to him: "No, period. Do not buy that stock. Forget about it." If it was a 4, I would try to talk him out of it. If it was a 3 and he really wanted to buy it, I would say, fine. My ranking system worked consistently; my ones as a group outperformed my twos as a group, which outperformed threes as a group, which outperformed fours as a group, which outperformed fives as a group.

J: If a money manager didn't want to buy a stock you had ranked 1, would you try to convince him otherwise?

AT: I would try to convince him, but I wouldn't lose any sleep over it. Money managers spent a lot of time not buying the stocks that I had ranked 1.

J: How much of your technical analysis is done on an intuitive and subconscious level?

AT: A great deal. This would seem to be in variance with what I did in most of the latter part of my career, which was to try to test indicators using standard statistical testing. If I could come up with an indicator and a way of interpreting that indicator that had a Chi-squared somewhere up through the roof, I would say, that's great, but I would still be intuitive about it.

J: What percentage of your analysis is intuitive?

AT: I would say 50 percent.

5.15.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

AT: As means of looking at individual stocks, I would feel very uncomfortable without having point and figure charts. This was for 50 years my preferred way of looking at individual stocks. Reliability is hard to measure, because you cannot do standard statistical testing on a point and figure chart, you can only evaluate the reliability of the opinion that arises from looking at that chart. But as far as I am concerned, this would be the most reliable method of looking at individual charts, more reliable than bar charts or candlestick charts. Like I said, among the least reliable are the Gann angles. I have not been as infatuated with the Elliott Wave principle as many people are, though I still look at it.

J: What do you think of the classic continuation and reversal patterns, such as, for example, the head-and-shoulders pattern?

AT: All of the standard patterns apply to point and figure analysis.

J: And you look at them as well?

AT: I do and I don't. To put it in the simplest terms, if you are looking at the point and figure chart or any kind of a chart for that matter, there are 3 kinds of patters: there is a base, which takes place prior to the time the stock goes up, there is a top, which takes place prior to the time the stock goes down, and the third kind of pattern would be "I don't have a slightest idea as to what the stock is going to do." Now we have a base, which is a precursor to the stock going up, and a subspecies of that base is a head-and-shoulders bottom. I've always been suspicious about trying to put too much nomenclature on it. This was something the early technicians did. They were probably trying to be more precise than they really had the equipment to be. If you want to simplify things and say, this is one of the number of patterns that tends to make the stock go up or down, you tend to stick a name to it. So, yes, I know what a head-and-shoulders is, but sometimes you have to turn things around. It the words of your friend Mike Epstein, "there is nothing more bullish than a failed head-and-shoulders."

J: What do you think about moving averages?

AT: If you are going to look at the time series of something like the stock market, you are going to have to do something to smooth the data. In the early days people used moving

averages; now they are getting into much more sophisticated smoothing techniques. Once you've picked your smoothing technique, you have to decide how to place it on a chart – do you give it a lead time, do you give it a lag time, where do you put it in relation to the last price of the stock.

J: What do you think about volume? I guess because you are primarily focused on point and figure, you don't really consider volume.

AT: That's right, since I do point and figure, I look less at volume.

J: How do you test patterns or indicators before you start using them with real money? Do you ever ask for other people's opinion when you are making such decisions?

AT: To answer the second part first, yes, I will use other people's opinion. If I want to get an opinion regarding Bollinger bands, the first thing I might do is call up John Bollinger. In addition, given a particular indicator, to the extent I can, I do standard statistical testing. I ask myself, "can I come up with a standard significance test, can I come up with an effective trading formula based on this indicator?"

J: Have you encountered patterns or indicators that generally work well but that, under certain market conditions, become misleading? Could you give me some examples?

AT: Yes, all my life. That's part of the challenge of technical analysis. Markets remain the same and they change. For the first 20 or 30 years of my career, one of the most accurate examples of a market top indicator that I know of was the measurement of total volume and upside volume. Starting in the 1930's and going to, I think, the 1970's, invariably all markets topped down in exactly the same way – by volume declining, and that volume decline being totally caused by a decline in upside volume, and all this took place with something like a 6-month lead time. This happened with every major top my father and I could recall throughout the early stages of our careers. Then it stopped. It didn't work any more. It doesn't work to this day – the markets top on increasing volume, not on decreasing volume, but they didn't use to. This is where you get into all that art and science fun.

J: Is the number of indicators you follow greater when your trades are larger?

AT: This is not necessarily the environment I've been in. I am dealing with money managers, and I am going to give the same opinion to Peter Lynch, who is running a 100 billion dollar fund, as I am giving to my colleagues who are managing 600 million dollars.

J: Is the number of indicators you follow always pretty much the same, or does it vary as a function of something?

AT: It grows over time. I was following more indicators at the end of my career than I had conceived possibly could exist. And the single factor that came into the picture was the computer. Think about a moving average. You kept up a moving average by counting back, punching the numbers into a calculator, and keeping up the results in a notebook. You should go sometime to the MTA library, and look at what people like Richard Russell and some of the old timers were doing to keep up their indicators. You'll find it unbelievable. You couldn't keep more than a few dozen indicators, there were not enough hours in a day!

5.15.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

AT: The evolvement is the development of a computer. Technical analysis is measuring an incredible amount of data. It's measuring every single transaction that takes place, so you are dealing with an incredible amount of raw data. Moreover, the amount of operations that could be performed on this data is infinite. You could not do one thousandth of them prior of the advent of the computer.

J: What was the evolution of the field of technical analysis itself?

AT: It expanded, it became broader and more complex. It became something that of necessity infinitely more resources had to be devoted to. The principles of technical analysis stayed the same as they had always been, but now we are able to implement these principles more accurately than before. In 1955 we were nowhere near the kind of the implementation that we have today because we didn't have computers to analyze stock prices, people had to do it all by hand.

J: As the field evolves, new indicators and patterns are being introduced. Do you try to stay on top by familiarizing yourself with the new inventions? Also, do you study the new inventions just to know what others might be doing, or do you also update your own strategies as the field evolves?

AT: Up until 1993 I was following just about everything that was taking place, and in many cases involving it into what I did. I've retired since, but I have maintained an interest in what is on the cutting edge of technical analysis.

J: To what extent do you rely on computer generated signals?

AT: I was relying on computer generated signals to an increasing extent, as more computerized data became available. It was not that long ago that computerized data became easily available. You can go back to the emergence of the ISL tapes which was in 1963 or 1964. But as computerized data became more and more available, I started relying more

and more on computer generated signals, first on the general market and then, as time went on, on the individual stocks. With individual stocks there is that much more complexity, because you are dealing with 5000 different names.

J: What are the advantages and disadvantages of relying on computer generated signals?

AT: The advantage of a computer is that is trillion times faster than I am, the disadvantage is that it is not as smart. A lot of the answer to this depends on what you are doing. Because I was dealing with longer-term oriented money managers, something I never paid a lot of attention to was short term trading. I have nothing against short term trading; if somebody wants to try to do it, it can probably be done profitably, what with decimalized markets, one-cent spreads and $19.95 commissions. But computer generated signals would be a necessity for short term trading. How else could you do it? If you are long term oriented, as I always was, some of that advantage disappears – you are taking computerized output and you are trying to intuitively reason from it. In short-term trading you have so many decisions to make, so you have got to have some kind of computerized input.

J: Some technicians believe that it is still important to construct your own charts by hand. Do you agree?

AT: I said for a long time that I agreed with it, but I became less convinced of it as time went on. For years, out of a series of over 5000 stocks, I kept a set of about 500 stocks that I posted myself by hand. I was a senior guy with a big corner office, but I was sitting there and making marks on charts because I thought it was useful. I thought it was useful because I thought it brought you closer to the chart. My hands-on work with indicators later on in my career went more in the direction of programming the computer myself to create new indicators. That became my hands-on involvement, rather than posting the charts. But I think that if there were 48 hours in a day instead of 24 I would still post 500 charts by hand.

5.15.5 The innovative process

J: What drives your innovative process?

AT: Curiosity and a lack of fixed opinion going in. I might have an idea while I am shaving in the morning, and then I would sit down at a computer to see if it works out.

J: Do you and to what extent collaborate with others during the innovative process?

AT: I worked my entire career as part of a team, so there was some collaboration involved.

J: Even when you were coming up with something new, as opposed to just practicing technical analysis?

AT: Yes.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

AT: Oh, yes. If I felt that relying on classical patterns and indicators was sufficient, I would have done nothing but read Alexander Wheelan's book and look at a whole bunch of point and figure charts. Instead, I've tried to go beyond that, though the point and figure charts, unlike some of the other things I mentioned before, never became useless. But clients were expecting more from me than simply opinions based on point and figure charts. I would love ideally to have 1000 more tools at my disposition than I am using now. You can't have too many tools.

J: How soon after you develop a particular technical tool do you make it accessible to public?

AT: Given the availability of a computer, I can backtest a particular technical tool, and if the result is impressive enough, I would make it accessible 5 minutes later.

J: Why do you share your inventions with others, rather than keeping the edge just for yourself?

AT: I like to think I am part of a profession, rather than some kind of a guru or a genius. I don't think anybody has or will discover "the secret." I've always been firmly convinced that a technician ought to be part of a profession, so I've always used tools that are 100 percent in the public domain.

J: Are there tools that you developed but never shared with the rest of the world?

AT: No.

J: How often do you use the technical tools you developed?

AT: All the time.

5.15.6 Emotional aspects of the craft

J: How did you feel when you first lost a lot of money? Has it become easier to lose as you became more experienced?

AT: Given the kind of environment that I was working in, I was loosing my clients' rather than my own money, and that bothered me. I was obviously to a lesser degree at first and to a greater degree later trading my own account, but I've never been a manager of a hedge fund, so I don't sit here and say, gee, I've lost money today or I've made money today.

J: Has a big loss (of money or clients) ever made you doubt the validity of technical analysis?

AT: It happened. When I got into the money management field, which was in the 1970's, we didn't lose a lot of clients, because we started with $30 million under management and wound up with $600 million. I tended not to lose clients who believed in what I was doing in the first place. Again, there was not a direct connection, because I am handing out advice over here and I am hoping that commissions come in a pipe over there, and if commissions were drying up from a given source, I would try to figure out why that might be the case; it might be because of a bad recommendation or for any number of other reasons. I've never had the discipline of saying, "OK, I am working with X amount of money, and the bottom line is Y, and if I am a hedge fund manager, I get 20 percent of the profits." This has never been the environment I've worked in.

J: Are you sometimes more cautious in your practice of technical analysis than at other times?

AT: I would not use the word cautious, but I would go back to the example I used before, and that is that the pressure on you at the top or at the bottom of the market is a great deal better than it is in the middle of a bull or a bear market, simply because in the bull market your mistakes cannot hurt you that much and in the bear market there can't be any mistakes if you are in cash.

J: How is the way you apply technical analysis different when you are more cautious, like at a turning point?

AT: It changes in that any indicator that you could think of is going to act differently at a turning point than it is in the course of an ongoing major secular trend. If you have a sensitive short term oscillator and you are looking for a major bottom, you are going to expect that thing to hit a much lower point than it would if you were in the middle of the bull market. Depending on where you are, you interpret exactly the same indicator entirely differently.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

AT: The answer is, yes, they do interfere and I don't think it's changed very much. We

can never keep our emotions completely out of the picture. Most of the time I've been able to have the attitude, "OK, this is what I do, I am going to go and make decisions, I am not going to be devastated by the bad call that I made the day before yesterday." I've had any number of emotional problems, but I am not sure that dealing with the stock market was ever one of them.

J: In general, is the ability to separate emotions from technical analysis an inherent trait, or do you feel that it can be learned?

AT: It's probably an inherent trait, or a lot of it is inherent. I don't know if it can be learned, and I've never tried to teach it to anybody.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[27]*." To what extent is this statement true in your case?*

AT: I kind of disagree with the statement. I am convinced that when you come down to it, everybody is either a bull or a bear. The ideal speculator would be somebody who had two bodies, the bull and the bear continually fighting each other, but I am not sure he exists. I have very seldom met someone in the securities business with whom I can't talk for 10 minutes and decide that he is basically either a bull or a bear. I am a bull, and I have to fight myself harder to be bearish than to be bullish. And I had to do it, obviously. There were bear markets. The dispassionate two-side fighting thing I don't think is ever true.

J: But an ideal investor would have two bodies fighting themselves?

AT: Yes.

J: Why is that better? It seems to me that if you are having this battle of greed and fear within you all the time, you might be unable to make a decision?

AT: I was not so much thinking of the greed and fear, but of the bull and the bear, though to the degree it's the same thing. Why is it better for investor to have this greed/fear or bull/bear battle within them? To the extent that the greed or fear get the better of them, they would be a failure. So they have to be able to temper one with the other. The statement I made before just says that it is often easier to fight against one side than it is against the other; I think we are born that way.

[27]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

5.15.7 The role of creativity

J: What role does creativity play in technical analysis? Can this creativity be learned?

AT: I don't think it can be learned. Good technicians are simply all creative – this is a definition of a good technician.

J: Is there such a thing as "talent for technical analysis"? Could you define it?

AT: More and more there has to be a willingness to be guided by actual facts rather than by myth. As we've improved standard statistical testing, the ability to pay attention to the facts has improved.

J: Can the absence of favorable personal traits be overcome by hard work and dedication?

AT: I am biased in the direction that anything can be overcome by hard work. But if you get down to the nitty-gritty of what makes a good technician and what makes a bad technician, I am not sure that there isn't some inherent ability that's in there. It's hard to say.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

AT: No. I would have to tell you to read "The Emperor's New Mind," which basically says that artificial intelligence is never going to exist. Despite the fact that I am a very strong advocate of the use of the computer, I don't think that technical analysis is going to replace people in any field. To go back to the statement that I made earlier, computers are tremendously faster than I am, but the problem is, they are not as smart.

J: Consider the statement "technical analysis is what you want it to be." If, indeed, technical analysis can be viewed as partly art, then, by definition, it should be capable of many interpretations, in which case this statement would become valid. What do you think?

AT: The last market letter that I wrote prior to my retirement was on the difference between art and science. Science is the continual building of knowledge; you build up on what has been done before. Newton was a great scientist; the average high school student today knows more physics than Newton did. Shakespeare was a great writer; nobody has been able to duplicate Shakespeare's plays. When you get into art, it's too easy to be a charlatan; it's too easy to say, "I am an artist and the rules don't apply." I think this is the case with a great deal of what is called modern art today, which in my view truly should not be considered art. If it can be duplicated by a 5-year-old, it's not art. So on one hand you have art, where there are no true answers and where there is room for all kinds of different opinions, and on the other hard you have science, which is continually developing and discovering truth. Technical analysis is a little bit of both. You have got a question coming

later on about astrology, but that's not art, that fraud.

J: What aspects of technical analysis would you consider to be art, and what aspects would you consider to be science? What percentage of technical analysis is art, and what percentage is science?

AT: I would say it's 50-50. To the extent that technician intuits, there is an element of art to it. But it's also a science, it's something provable. With the use of a computer, I can prove that certain principles work.

5.15.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

AT: No more or less than the role of luck in anything that involves uncertainty. What determined whether a baseball player makes a successful hit? What determines whether a soccer player scores a goal or not? To a great extent their skill, but there is also something that goes beyond the skill. So there is luck in there, but it comes in the individual cases, and it cancels out over the long term.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

AT: Yes.

J: Why?

AT: Because astrology is a fraud. Nobody has been able to prove the validity of astrology, and to a degree it has even been proven to be a fraud. On the other hand, that's just my opinion. If you were to ask Eugene Fama, he would tell you that the idea that you can get any meaningful information whatsoever from stock prices is a fraud. So while I may think that Arch Crawford is a fraud, Eugene Fama may think that I am a fraud.

J: I've been told that Arch Crawford has been very successful in his calls over the years. How would that be possible?

AT: You have to be very careful when you say that somebody is very successful in their calls. First you have to define the universe of what calls are made and when. If you are very successful in your calls, you will be able to show me a written document of your calls which outperforms S&P 500 while trading with the S&P 500. I can do it to a degree, like in my ranking of stocks from 1 to 5, where I find that 1's outperform the 2's outperform the 3's outperform the 4's outperform the 5's over the 20-year period that I was doing it. The

written record is there.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

AT: I can prove that Gann angles are false. I have relatively little faith in the Elliott Wave, although I have some. But there are some very brilliant people who firmly believe in the Elliott Wave and Fibonacci numbers, such as Bob Prechter and Henry Bolton before him. But I personally haven't found it that useful. I've been lead into more bad calls by the Elliott Wave than I've been lead into the good ones. I still look at it out of pure interest, but I don't take it that seriously.

5.15.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

AT: Yes, but that's not a fair question to ask me, because it was in the family. I would have had to have some kind of psychological conflict with my father not to be convinced of it.

J: Did you become more or less convinced since when you first started?

AT: More. Oh, sure.

J: Did the lack of credit many academicians give to technical analysis ever discourage you?

AT: It makes me sad, it doesn't discourage me. I think that the Random Walk Hypothesis did what it was intended to do – it got Eugene Fama a full professorship at Chicago. There was unfortunately almost a personality conflict between the early Random Walk Hypothesis proponents and technicians. That's why I am interested in seeing a synthesis develop between the academic and the professional technical communities. I find myself drawn to the sort of work that Professor Andrew Lo is doing. I don't want to put blame on either side for it, but I just don't think there should be a conflict. Fortunately, the fortress walls between the two disciplines are falling. The pure Random Walk Hypothesis is no longer, it's just the question of to what degree you find yourself drawn in one direction or the other.

J: What, in your opinion, is the best proof of the validity of technical analysis?

AT: It improved the performance of money managers.

J: Did you find that your experience with technical analysis contradicted statements made in books (and by books I mean classic technical literature, such as Shabacker, Gartley, etc.)? Did that ever discourage you?

AT: Shabacker and Gartley made mistakes, but they were writing in the 30's, when we knew much less. I don't fault Hippocrates for using leeches – this was in the early stages of medical science, and Shabacker and Gartley were writing in the early stages of technical analysis. Do you know how Gartley developed the 200-day moving average? He found about 30 women who did not have jobs and sat them down with hand adding machines called Comptometers, and had them figure out moving averages at 5-day intervals, starting from 5 up to 400, and he eventually came up with the idea that the 200-day moving average worked well. That's the kind of tools he had at his disposal at that time.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

AT: There are no proven theories in a sense that you cannot say prices behave the way they do because of Newton's Second Law, but you can prove that something is correct in effect rather than proving the principle of why something should be the case. You could prove that the stock market on average has had an above-average return over the 80-year period that we have under study, because you can sit down and measure the stock market returns over the last 80 years. Now, you could say that it's all going to be different over the next 80 years, because the next 80 years aren't the same as the past 80 years.

J: So would you say that there are no hard and fast rules in technical analysis?

AT: They have to be bent a little bit. So I would agree with the fact that there tend not to be hard and fast rules.

J: Does that ever bother you?

AT: No.

J: Why not?

AT: Why should I be bothered? The perfect should not be an enemy of the good. I had a wonderful life doing technical analysis, I was successful, I enjoyed doing it, and I was helpful to a lot of people.

J: Do you believe that technical analysis works even when applied to data other than the market action data? If yes, how is that possible? If no, please explain.

AT: I don't really have a good answer to that, because I never tried it. To a certain extent, rules of data are universal. Any data series will have a mean and a standard deviation. But can a make a point and figure chart of something that is not traded in a financial market and draw sensible conclusions from it? I would doubt that it would work. Point and figure works when you are dealing with behavior and financial markets. There is no reason to expect it to work therefore in the cases where financial markets are not involved.

5.15.10 Lifestyle

J: Could you describe your working day?

AT: I am currently retired, and I try to sleep as late as I can and spend the rest of the day fooling around analyzing stuff that interests me and doing a lot of reading that I never had a chance to do while I was working. To a degree because of the nature of my business, I was least able to do effective technical work between 9 and 5, simply because I had to deal with clients for the most part. That did not bother me, because clients were always very kind to me, but it was always nice to come home in the evening and work on my computer program or look at a set of charts without the pressure of a client making a call which you had to answer.

J: How many hours each day do you spend practicing your craft?

AT: It would vary depending on what I was working on. It might be very short, or I might be up until 2 or 3 in the morning working on my research. I would say that I spent considerably more than 8 hours a day doing my job. Was all of that spent practicing technical analysis? No, unfortunately it was not, because my job of dealing with clients took up a great deal of time involved in a day. I also traveled a lot, which I enjoyed.

J: Which aspect of your job did you enjoy more, working with clients or working on research?

AT: Working on research. However, working on research would not have any economic value whatsoever without the clients. I needed the clients to put the economic value into the research.

J: Are your sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

AT: Yes. Oh, sure. There was stress involved, but I never felt stressed out because of technical analysis. This is something I developed early on – I could make a bad call and live with it and I could make a good call and not think that I was the latest incarnation of Einstein. On the other hand, I found many aspects of being in business very stressful, such as clients, colleagues, all of that stuff that goes into a day spent in human relationships is

by nature stressful.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[28].

Would you agree with de la Vega? To what extent does your trading control your life?

AT: I would certainly disagree as far as my own professional life is concerned. But I was never a speculator per se. Speculation is money management at one level, and technical analysis and money management don't necessarily need t be coupled. Although technical analysis can be used as a sole input in managing money, it should not so be used, there should be other inputs. But to go back to your question, I loved doing technical analysis, but did I devote 100 percent of my time to technical analysis? No. I read books, I traveled. I tried to take vacations, and I would occasionally do work on the weekend. I never had any problems developing a balance in my life.

5.15.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

AT: The way the industry is going, I think the formal education has to include some pretty in-depth statistical training. I am talking about math through the calculus level and 3 or 4 levels of statistics. I did not have that nor did most of the technicians my age, but if you are going to start out now, this is the direction you should be going in.

J: What advice would you give to technical analysis students? What is the key to success?

AT: Have a good time. Enjoy it. If you are a student of technical analysis, it almost goes without saying that this turns you on somehow. You have to like what you are doing. I made a fair amount of money from technical analysis, but that was never the reason I did it.

[28]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

5.16 An Interview with Stan Weinstein

5.16.1 The early days

J: Could you tell me what and when first triggered your interest in technical analysis?

SW: Sure. It's an easy story to tell. I've had an interest in the stock market since I was a kid. My dad was interested in the stock market. But, just like most people, I started in a more of a traditional way. Without naming names, I followed some of the big fundamentalists, and the things that were supposed to do very well did not do very well. I ended up losing my bar mitzvah money, and figured there must be a better way. When I went to college, I studied economics, although they taught traditional methods, not technical analysis. One day, at the school library, I found a book called *Technical Analysis of Stock Trends*, by Magee and Edwards. I read it, and it seemed interesting to me – I am willing to give anything a shot. So I started doing some charting, and, back at the time, I didn't make a lot of money, of course. It's kind of like taking a tennis lesson. Initially, as I was learning the ground strokes, I found that I was losing less money, maybe made a few dollars. The more I dwelt on it, the more I started to feel that my future was more than a little bit with technical analysis. The Edwards and Magee book really talked to me, and I loved it when I read it. I thought, this is great, and some day I'd like to add a little something to technical analysis. Then, years later, I ended up writing my own book, *Secrets of Profiting in Bull and Bear Markets*, where I took off from the good principles of Edwards and Magee. I added a few things of my own – Magee and Edwards didn't have moving averages, for instance. I also simplified some things. In fact, it was my purpose to really make it easy to read, because Magee and Edwards is terrific, but very difficult to read.

J: How much time did you spend studying technical analysis before you felt prepared to use it with real money?

SW: I started right away doing it with real money, but doing it easily. And I just kept doing it more and more. My wife and I – we met in high school and went to college together – we used to keep charts, and the more I got into it, the more relevance I saw in it. So, I started right away using charts and making mistakes, as you do with any new endeavor. When I was on the seminar circuit, I used to give people classes in technical analysis, which I don't do any more. I'd tell them, I could give them a tennis lesson, but, I can only take them so far. They have to practice the ground strokes themselves, and get the feel themselves. Someone can teach you the forehand and the backhand, but it takes a while for it to become second nature for you. It's the same thing with technical analysis. After doing it for a good couple of years, you develop a feel. Everybody doesn't get that feel. I know it sounds mystical, but it's the feel itself that's important. After a while I can just look at a chart, and sometimes certain things will just talk to me. Sometimes I see people on TV, without naming names, and they are saying they like a certain stock, whereas I think the chart is terrible. They are advocating certain positions based on their interpretation of technical analysis, but I'll

take a look at it and say to myself, not with my money. It's just like with doctors, there are good doctors and there are bad doctors. In our field, there are good and bad practitioners.

J: What are the things that you never saw in literature, but that you only learned after you started applying technical analysis to real money?

SW: That's a tough question, because I've read so many books. I don't honestly know. I've been doing it now for well over 40 years, and for so many things you forget whether you developed them yourself or borrowed from someone. The more relevant question would be, what are the things that I think are important to bring to the market, not that I never saw them written anywhere. To me, there are certain truisms that go way back into the 30's, and are still relevant today. For example, a part of good technique is to always cut your losses quickly. A lot of the books I've read on not just technical analysis but on the stock market, only talk about the good, about all of the things that look so easy, but they don't talk about things that go awry. In my book I have a chapter about the mistakes I've made and the things they taught me about making money in the market, and that's one of the things I am proud of. The truth is, only liars are going to be right 100 percent of the time. I think my book separates a real winner in the stock market from people who are only going to be so-so. It's very important to learn how to take losses. People don't realize it, but even if you are right only 50 percent of the time, though I think you can do much better than 50 percent, you can make a lot of money in the stock market by letting your good stocks run, by letting the trend work for you. If you make good money on a winning stock, I think you can certainly be right at least 70 percent of the time. And if you take small losses, when you lose, it can become a very profitable endeavor. If you have a false break out, I think it's very important to get out immediately, especially if you are trading – that's one of the things I think I never really saw written anywhere, but that I have written myself. Let's say a stock XYZ breaks out above 20. If it does break out and closes at 20.5, or 21, that's usually going to work, that's a good thing. But if you have a situation where XYZ broke out, and say went to 20.5 today, but it closed at 19.5 tonight, I get a bad feeling in my stomach. From a trading point of view, I think it is going to be a loser. What I've learned over the years is that the really, really good trades are going to be clean. They are going to break out and close above the resistance level. They are going to stay above that resistance level – that's one of the key factors to consider in deciding whether or not you are dealing with a false breakout. If it's a false breakout, take a quick small loss. It's better to take the first little loss than a big loss. The second thing that's important – this has been written in many places, as well as by myself – volume is a key factor. If you have two stocks and both look good, and one breaks out but the volume is only so-so, I would say that that stock doesn't have as high a probability of working as the stock that breaks out on significantly higher volume. I wrote about that in my book. The really good breakouts are usually accompanied by a volume level that is triple the normal average volume.

J: Which mistake did you learn the most from?

SW: Good question. I don't think there is any particular mistake, I would just say that all the mistakes I've made over the years – and believe me, we've made many – become like a total gestalt. It all comes together and it's slowly added to my discipline. It's a slow building process where you put one brick down at a time. When I first started trading as a stockbroker, if a position didn't work, I would stay with it longer and wish and hope. I soon learned that it is better to quickly take a loss on a position that isn't working, and stay with the ones that are working. Also, in the early years, I would look at charts more in a vacuum, and not pay as much attention to the market sectors. And all of these things, mistakes, helped me grow and helped me develop my system, that I write about in my book, and which I call my forest to the trees approach. I look at the big things first. If the market is very bearish, the way it was in say 2002, even a good stock has less likelihood of working (even though some of them will). Obviously, you are going to bet less of your capital when the major trend is against you, than when the trend is with you. That's an important thing to learn. You start with the forest, which is the big thing, which is the market, and work your way down. The second thing I always look at is which are the best sectors. You always want to focus on the most positive sectors because I think they have a greater likelihood of working. At the same time other groups are often negative and should be avoided even if the overall markets is bullish. So, in my forest to the trees approach, I first ask, is the market bullish, and if the market is bullish, I want to be more long than short. Then I want to look at sectors, and, where I am long, I want to be long in my most favored sectors. Conversely, if I am doing shorting or advising clients to be light on the long side in certain groups, I want to stay away from groups that are performing poorly. In other words, if I am going to buy, I want to buy in the best sector, and when I want to short, I want to short in the worst sectors. So, there isn't so much a particular mistake that stands out, but when I was starting out, I was young and less experienced, and looked at things more in a vacuum. Over time I realized that the important factor is not just the chart, but also the sectors and the market itself.

5.16.2 Personal style

J: Could you describe your own distinct style of technical analysis?

SW: Without going into great detail, I think it's a very simple system to understand. And I've read about all the other systems, I know about all the different technologies, and I'll even use some of them. My system is basically very straightforward – basic charting and chart configuration. I look for patterns. If a stock is making a head-and-shoulders top or a double bottom. I also pay a lot of attention to moving averages. Moving averages are a very, very key part of my system, which is one of the things that Magee and Edwards did not have in their book and that I later added to my system. Very importantly, in my system I use three major moving averages. I use a 200-day moving average, which is what most people use. But I also use a 150-day moving average, because I've found that a 150-day moving average usually gives you a head start by 30 plus days over the 200-day one. And if you

move above or below the 150, the probabilities are very strong that eventually you'll break above or below the 200. Then, the third moving average I use is a 50-day, which is more for trading. If I have a position that I like very much, but if it starts to roll over and break its 50-day moving average, I would definitely do, at least, some "trimming" of the position. I am very robotic and never violate my discipline. That's another thing that I think I bring to the table with my system – it's very straightforward, very robotic. I never say, "this is a special case that I can ignore, because I like the company." If a stock is in a long-term uptrend, and it's rising above the 50, 150, and 200-day moving averages, it would make for an excellent position, but as soon as it breaks and closes below the 50-day moving average, I am going to trim it. I am definitely going to trim it, and then I'll see what happens thereafter. I always try to move incrementally, in the stock market and in life. A lot of people will stay bullish until it breaks a 200-day moving average, and they give away a terrific amount of the profits. I like to move step by step by step. I don't think the market changes over night. If the stock is terrific and we are riding it up, and it starts to make a little head and shoulders top, and it also breaks its 50-day moving average, I'll sell a third of the position. And then if it has a normal correction and holds above the long-term moving averages, I'll buy it again, when the correction is over. Conversely, if it starts to go down further, let's say it breaks 150, I would sell another third, and when it closes below the 200 day moving average, then I am gone. So, I move in increments. To summarize, the most important part of my system is pattern recognition, moving averages, and as I told you earlier, volume. And then, I factor in the sectors and the big market picture. On the whole, it's a very straightforward system. If I am bearish, like I was from the Spring of 2000 to the Spring of 2003, I want to be more short than long. Then I want to be looking for the worst sectors to short. Even though I may have a couple of longs, they are to be much more short term oriented. Conversely, since March of 2003, when I put out my bull market buy signal, I had only a handful of shorts, and many, many longs. I also look at the sectors – if I have two charts that are equal, I am going to go with the one that is in the group that I love. Furthermore, if a stock is a very short-term trade, then I'll bring to the table things like stochastics, which is a short-term oriented indicator, to fine tune the trades.

J: In your experience, is technical analysis more effective when practiced individually or in teams?

SW: In my experience, it's better to practice as a single practitioner, rather than in a team. But that's just my philosophy. I can just tell you that years back I did work in a place where we did some teamwork, and that wasn't as rewarding. I guess it's also a part of one's personality. When I was on the seminar circuit, I used to tell people, know what you are. If you are a trader, don't try to be an investor, you won't be successful. If you are an investor, don't try to be a trader. With an investor's kind of mentality you won't be successful as a trader, and vice versa. It's the same thing here. For example, I like to reap the benefits if I am right. If I am wrong, I take the hit from my mistake, and don't try to blame it on anyone else. What I don't like about teams is that different people see different things, so instead

of having somebody who says I am going to act on this, somebody else says but I see this, and then you start arguing, whether to do this or to do that. I don't think it works. I have my feel, I have strong feelings, and if I have a strong feeling, I don't care about what anyone else says, I am going to go with my feeling. I don't want to start factoring in somebody else's opinion. It won't work for me. But that doesn't mean that somebody else, who has a different type of personality, wouldn't perhaps be better in a team environment. I know the way I function, and that's why I've chosen to work the way I do.

J: What is it about the way you use these tools that accounts for your superior returns?

SW: I don't want to sound egocentric ... I am a big football fan. Joe Montana and Dan Marino were great quarterbacks. Somebody could say to them: well, we all pick up a football, and how come you are better than somebody else throwing the same football with the same motion? I think there are certain God-given talents and feels with the ball. I also think different people have different discipline. I am neurotically disciplined. If I see X happen, I am always going to do Y. So I feel that I have a certain feel, I guess it's a God-given talent, and I definitely will never violate my discipline. I am a very, very disciplined person. I think that probably accounts for my success. I could say, it's because I am so smart at it. But, I don't think so, it's not because I am so smart, I think it's because I always cut my losses. Even though I obviously have a strong ego, I know that the market is smarter than me. That's another part of my success, I never argue with the market. Without naming names, I've seen some people who have gone down the tubes, because they were so stubborn and argued against their indicators. I know my indicators and charts are smarter than I am. So, I think one of my talents is that I always try to be in gear with the trend. The trend is your friend. I never argue with it. When people say, oh, you are so flexible, I always kid around, I tell people, yes, I am ready to change my mind on the next uptick or downtick if it doesn't feel right. I used to joke when I was on the seminar circuit, I used to say everybody who picks up a paint brush is not Picasso. We don't all have the same talents. So, my success is due to a combination of things. I think I have some talent. I also know that I have a very good system. And, as I said, I am very very disciplined – every time you show me X, I know I am always going to do Y, I am never going to say "this time is different."

J: How do you deal with the problem of tradeoff between early signal detection and sensitivity to random noise?

SW: It's a great question. That's becoming tougher, especially in this environment. Whereas in the old days I used to have many more mutual fund clients, now more and more of my clients are hedge fund managers, and they do create a lot of "random noise." You can see their activity all over the tape! I would just say, you can separate out the noise by following the big pictures on the chart. You have to separate the short-term and the long-term action. For example, yesterday's market may have been terrific, yet today it's suddenly down. In such a situation it helps to have a little bit of an overview, to follow the big picture,

and to say: as long as my big "goal lines" are not violated, as long as I am comfortably above the 50, 150, 200-day moving averages, and as long as no serious violations have taken place in terms of patterns, I am OK. The long-term picture still looks fine. So I think that's the way to factor out the random noise. As long as the big patterns are OK, and haven't done anything bad, and haven't broken levels that shouldn't be violated, even trading-wise, and you are still above all your moving averages, then the selloff isn't serious. That's the best we can do to deal with the increasing volatility. But there is no doubt that in the past few years, the volatility has become ridiculous. It's a fact of life that we have to live with as hedge funds become a bigger and bigger part of the market and they move a lot of money in a hurry.

J: Is technical analysis more effective when used on its own, or when combined with fundamental analysis?

SW: I am not anti-fundamental, but I think there are cases where technical analysis can be more effective when used on its own, especially in selling. In my book, one whole chapter was on selling. Selling is much harder than buying. It's easier to know where to buy than to know where to sell. I think that on the sell side, technical analysis should totally be used by itself, and not in conjuncture with fundamental analysis at all. The market is supposed to be a discounting mechanism, and by the time the bad shows up in the fundamentals, it's too late, you've already topped. So, on the sell side, I think the approach should be 100 percent technical analysis. On the other hand, even though I am a strict technician, I do see the relevance of adding in maybe 20 percent of fundamentals with 80 percent of technicals on the buy side. Even though I personally just trade 100 percent off of the chart, if a chart of stock A and a chart of stock B look about equal, but company A has a terrific new concept or new product, I'd choose stock A. I think that you are better off with something that you can put your hands on. Don't get me wrong, I'll still do the chart, but on the buy side, unlike on the sell side, if I can see something that makes sense and get a fundamental edge, that's great. If a chart is not only a good chart, but it is also in an area that's doing very well, that's a bit of added "whipped cream." But one thing I want to make very, very clear is that, if the fundamentals are good and the chart is good, that makes me feel a little bit more comfortable. But all things being equal, if you do have a great chart and terrible fundamentals, I would still go with the chart. I'll be advising mutual funds, hedge funds, and they'll follow up with these terrific fundamental stories, and I'll look at the charts and say, these are awful charts, there is no way on God's earth that I'll buy that. So, I think fundamentals can be a little bit of an added plus on the buy side, but if the chart is bad, I'll never ever buy it irrespective of how "glowing" the fundamentals are.

J: How much of your technical analysis is done on an intuitive and subconscious level?

SW: I've never quantified it, but I would think it's probably 80-85 percent mechanical. When I was on the seminar circuit, I used to hold all these classes where I would teach people and they would "get it." So it's certainly at least 85 percent mechanical. I think there is

probably about a 15 percent intuitive factor. I get a little bit more of a tingle so to speak than somebody else. People will often say, oh, that's a Stan Weinstein chart. They know the kind of patterns that I am looking for: coming out of a base, very low risk, volume is starting to pick up.

5.16.3 Favorite patterns and indicators

J: What do you consider to be the most and the least reliable technical indicators?

SW: Now we are talking not about the stocks, but about the market?

J: That's right.

SW: That's a very, very tough call. I wouldn't pick any one indicator. I break my indicators on the market down into three groupings. The momentum indicators, or, as I call them, the here and now indicators, are the most reliable. Here we are talking about advance-declines, divergences, the AD versus the Dow, about the things that are here and now, and the things that deal with trend. So I think that's the most reliable. The second level belongs to the sentiment indicators, and they are a little less reliable. They are still helpful, believe me, I look at them. For example, the percentage of bullish advisors has been very high for several months now, and a lot of technicians have been writing, there are too many bullish advisors around, and that whole thing. I always take what I call my weight of the evidence approach, which I developed years ago, and that is, I listen to the majority of indicators. For example, if you look at the VIX which is the volatility indicator, that would say that the market is dangerous; if you look at the percentage of bullish market advisors, that would say the market is too complacent. I still respect those, but I will override them if the majority of my indicators, especially in the momentum area, stay bullish. Finally, the third level belongs to the monetary indicators. Don't get me wrong, these are important too, I wouldn't use them if they didn't matter. I use all three of them, but I think the momentum indicators are the most important of all, the sentiment indicators a little less important, while the monetary ones have some relevance, but are not as important as the other two.

J: Could you give me some examples from the third category? What exactly do you mean by monetary indicators?

SW: The third category would be things like the net-free reserves. In the second category, I already gave you the example of the VIX, and the percentage of bullish and bearish market advisors. In the first category you will find the market averages themselves in relation to their respective moving averages and the market averages in relation to each other. I am a very big divergence person. If you look at the Dow and it is going to a new high, while everything may look fine, if the other averages (such as the S&P 500 Index) don't confirm

that high, that is worrisome. That's a divergence, and it bothers me. Historically, such divergences signal that, at least, a short term top is forming.

J: Is the way you apply technical analysis different when you are more cautious than when you are less cautious?

SW: Absolutely not. You ask very good questions. The principles are the same, but I'll play differently. If I am more cautious, and I see a lot of things that bother me indicator-wise, but the stock does break out, I may still buy a half of X, instead of a whole one. So tactically, sure, I'll tilt on the margin, but there is no way that my system or my reads change because I am more or less cautious. That's where my feel and gestalt really kicks in. We go through 2500 charts a night here, we look at them the same way every day weather we are bullish or bearish, and in the process I develop my feel about the big picture, about the market. That's one of the things that helped me catch the bottom this past March – even though the averages were coming down and down, I felt more are more stocks were refusing to come down, and I saw significantly fewer stocks at new lows (compared to say October 2002). And a lot of stocks were no longer moving down even though the averages were coming down amid worries about Iraq in mid-March, 2003. So that's where the intuitive feel comes in. I just felt we were getting very, very close to a bottom, I just had a feel we were getting there.

5.16.4 Evolution of technical analysis

J: How has the craft evolved since when you first started?

SW: Here are some of things that have changed, and I wrote about that in my book, and Magee and Edwards did as well. We used to see many more saucer bottoms. Over a 6-month period, the mutual funds and a lot of individual investors would slowly accumulate stock. You had much more time to round out your positions. So, people ask, with things moving so quickly, is technical analysis still relevant, did it change? It's still the same. I guess nobody wants records any more, but let me use this analogy where I think of records. It's like they speeded up the records from 33 rpm to 78 rpm. They are playing much faster. Everything develops faster. Certain things used to develop over 6-month periods, and you almost never see that any more. Once in a while you still do, but very rarely. Now, changes develop over six weeks, so the accumulation and distribution is much faster. Everything is much faster; it's become a little bit almost like a commodity market. I know that charts are helpful in commodities. I am not much of a commodity player, but you have to know that patterns work faster in commodities, and you have to use short-term moving averages. This is why I advocate and advise people that they still should look at 50-day moving averages. The things change much, much more rapidly today. Charts are still valid for the simple reason that what we are really measuring is supply and demand, which is never going to change, and human nature is never going to change. Fear and greed are always the same. When a stock is rising, everybody thinks it's going to 1000, when it stops and drops, everybody

thinks, it's going to zero, I am going to lose all my money. So that doesn't change. But what has changed is the rapidity of how fast patterns develop. That's one of the things that we had to adapt to. You don't get these nice bases that take 6 months or a year to develop. Things are changing much quicker, and you have got to be ready. But it isn't like it happens overnight. Now, it doesn't happen in months or years, it happens in weeks or couple of months.

J: To what extent do you rely on computer-generated signals? What are the advantages and disadvantages of relying on computer generated signals?

SW: First of all, you are asking the wrong person, because I've tried them, and I thought this isn't it. I don't use computer-generated signals at all. I am very old fashioned. My wife laughs and says I've only recently joined the 19th century. We'd go out of town and I didn't bring a PC. They just got me the PC that I can bring anywhere and have my charts. So that's sort of a big help. But I am very bad with this stuff. I am a different generation. I switched over to computer-generated charts only about 10 years ago. The staff in the office hated it, but we used to keep up 2000 charts a night by hand, you wouldn't believe how many people we had here charting. But I like the feel of looking at charts on paper. We are now past that, so now I look at the charts on the screen, and go over all the blues and greens and reds, but I don't use computer-generated signals at all. I am a tremendous sports fan, and I always say, I don't care how you move down the field, whether you are running or passing, whatever works for you, as long as you get across the goal line. I am not putting anyone down, and if someone can make a lot of money using computer-generated signals, God bless them. I am a feel person, I don't go by any computer generated stuff. I go strictly by my feel and by my signals.

J: So you do believe that it is still important to construct your own charts by hand?

SW: I happen to think it's nice, I really think it is. And I still get a little bit of a better feel, but I think it's what you are used to. It's not realistic for most people, unless you are just going to keep a handful of charts a night. I used to plot it, my wife and I used to do this back in college. But in the real world, most people are not going to find time for that; there is a tradeoff of time versus getting used to looking at the computer-generated chart. Even I, an old fashioned kind of guy, honestly use computer-generated charts today.

J: What kind of extra insight do these hand-generated charts provide?

SW: It's probably just a focus kind of thing. It makes you focus more when you have to physically plot the day's action. It kind of feels like, it shouldn't have come down that far. So I think hand charting probably just makes you more aware. But like I said, after 10 years of using computer generated charts, I am doing fine with that. Whatever you are used to is fine. Maybe it's not as perfect, it's like a difference between an A+ and an A. I think the

hand chart would be an A+ because you really look at the day's action in a more distinct way. Right now I am looking at the screen and it all looks a little bit like a blur. You see the big picture, but you don't feel today's action as clear and clean as you would, had you charted it yourself. But you have to ask yourself, what is the bang for a buck? It's a little marginal extra you get off of it, but face it, everything in life is a tradeoff, I don't think you are getting that much of an extra that's worth all that time. Some people are doing only a handful of charts, and they can do it by hand. But here we are advising clients, we need to construct more than 2000 charts a night, and there is no way on Earth we are going to do it by hand any more.

5.16.5 The innovative process

J: What drives your innovative process?

SW: I think it's the desire to be great. I kid around a lot of times and call myself the Michael Jordan of technicians. I like to think that I am certainly one of the best. I think that's what drives me. At this point in life, I am 62, it's certainly not the dollars, but the desire to excel and the gratification I get from it, knowing that I am going against the best minds and the best computers on the Street. When you win and come out ahead, it's a great feeling. I am a competitive person, this is what you are born with. I like the winning process. I put out a sell in the Spring of 2000, and that was wonderful, and I put out a buy in mid March of 2003, and I love it. But, believe me, we've all had our misses. So it's not just the dollars, the fact that people pay me and say thank you. I love making it work and happen. When I see somebody pontificate about the random walk, saying there is nothing to technical analysis, I just laugh to myself. In fact, that's part of my growth process. When I was young, in my 20's, I wanted everyone to believe in the technical method. I've come to realize, it's really good that we have so many people out there who don't believe in technical analysis, otherwise I think perhaps it wouldn't work as well. If we all did the same game, and we all see the stock is terrible, to whom are we going to sell the stock tomorrow? Years ago everyone used to use Barron's confidence index, and it became widely followed – it became terrible after a while. Something that's too widely followed becomes almost self-defeating. In my humble estimation, at most 1 out of every 10 people will ever truly end up following the technical method. They may start out that way, they may give it a shot, then they'll get whipsawed, they'll get a false breakout. I guess it's human nature – it has to make sense to people before they can embrace it. It takes a certain kind of person who'll accept technical analysis. I know that large groups of people keep bringing out fundamental recommendations, regardless of the fact that they have been wrong so many times. What I find interesting is that just the opposite is the case with technical analysis – most people, if they don't make it right away, if they lose money trying one or two trades, say: ah, I knew there was nothing to this. But, that's what they've expected all along. Let's face it, technical analysis doesn't make sense to people, especially to some of the academic types. It doesn't validate what they are taught. Some of these MBA's are really annoyed when I am

right and they are wrong. It really bothers them because they've done all these theses and everything, and they think, how can a person just look at a crummy chart and have a higher batting average than somebody who's done all this work? A lot of people are naturally going to be anti-technical. At this time in life I think that's OK, it's really OK, because I see it working better than if we had everyone in our camp.

J: Were there moments when you felt that relying on classical patterns and indicators was simply insufficient, and that developing new technical tools was necessary?

SW: There weren't particular moments. Rather, it's a continually evolving process from when I started out back in the early 60's, turning away from the fundamentals and leaning more toward technicals, to becoming so heavily technical. In the 60's I was much more all chart. Then, going through a lot of bear markets in the 60's and 70's, I asked myself: Am I paying enough attention, could I have spotted that the bear market of 1966 was coming? Well, at that time, I didn't see it coming, but then I developed my system and I started using some indicators, and I did see the bear market of 1969 develop pretty easily, as well as the bear market of 1973-74. So it's an evolving process where you start out with just a chart, you see it doesn't work, then you start using market indicators to be more aware of the big picture. Then you realize that, even if you are in a bull or bear market, there are always certain sectors that will go the opposite way. Over the years, I was also getting more and more into divergence analysis. I've always looked at new things, even now, and I've been doing it for 40 years, I'll say, that's a good idea, I think we should try that. So, as you do more and more stuff, your opinions grow and evolve. It wasn't anything like I had particular moments of revelation.

J: To what extent do you share your inventions with other?

SW: I shared totally with the rest of the world. I developed my 11 o'clock indicator years ago, where I just took the net change from 11 to 12 o'clock. Then I saw that other people were saying in their market letters that it was their indicator. Along the same lines, I developed the last hour indicator, and I've seen other people using it. I also developed my most active stocks indicator, where I just took the net change of the 15 most active stocks today, and started running moving totals on it. Furthermore, I developed my stage analysis – everybody at least gives me credit for this – which says that any stock can be categorized into one of the four stages: stage one is the base, two is the advancing phase, three is the distributional top, four is the decline phase. Even my granddaughter, who is 10 years old, knows about this. She says, oh, grandpa, we could never buy that, that's stage four! One time, two years ago, she was sitting in my office, and I was talking to a client. This is a big guy, and he was asking about a stock. I was thinking, what a horrible chart, and she suddenly blurted out: tell him grandpa, he can't buy that, that's stage four! And I remember thinking, here is an 8-year old kid who can get the system, and knows that the stock has a low probability of success, and yet this client who went to an Ivy League school

and is so fundamental is more likely to be wrong. The reality is I always share. When I used to do the *Professional Tape Reader*, when I was doing the writing, I always felt like I was trying to talk to the readers as if they were in my living room. That's how I wrote in my book, too. I asked myself, what would they want to know and what do I want to tell them. A lot of times, you see these systems and they are so confusing, I can't understand them, so I figure, they're trying to confuse people. I believe in the old KISS saying, in keeping it simple. If you keep it simple, it works just fine. I don't do the *Professional Tape Reader* any more, I now just advise institutions with my Global Trend Alert service. There are hedge funds and some mutual funds, and some of them are very, very sharp, and they know their technicals well. But there are also some fundamentalists who want to hear what Weinstein has to say, not because they believe in technical analysis, but just because they've heard that I have a high batting average and that so many people follow me. That's fine, if they want to think that way. Anyway, I am not trying to hide anything, anybody can go through my work and follow it.

J: Why do you share your inventions with others rather than keeping the edge just for yourself?

SW: I think that if you and I are on the same page, I can be of more value to you, rather than if you just take it and say, OK, Stan said sell, I am going to sell. So I think I can make you a better client of mine by you seeing the world as I see it, seeing where I am coming from. In fact, one of my largest institutional clients today was a strict, 100 percent fundamentalist when he started with me about 13-14 years ago. He just wondered about technical analysis. He said: I've heard, you have a pretty good record. Then many years later, my wife was laughing as he was now sending us an email, and he said, let me know where to put my stops, where will it break down, etc. Before, he didn't even know what stops or breakouts were. So the more I can get you to see why I am saying what I am saying, I think the more value added I can be and the more you'll feel comfortable with my advice, rather than if you just say, OK, he says it, maybe I'll do it. I've always felt that way, and I think that it works, whether I am writing in the *Tape Reader* for smaller investors or dealing with humongous institutions. For me, it's also very ego gratifying. All of us at some point, hopefully not for a long time, have to move on to the next world, and we have a legacy. I still get letters from people who used to be *Tape Reader* subscribers. I got one of them 3 or 4 months ago, and the guy said: I want to thank you, I am sorry you don't write the *Tape Reader* any more, I just want you to know that having read the *Tape Reader* for 15 years and having read your book, changed my life. And he told me how he has retired and he's been so successful. That's great. I've never met the guy, but that makes me feel good. We are only here a while, and we try to make the world a little better place, we try to help a couple of people and leave something positive to the world. So there are two reasons I share: one, pragmatically, it makes you a better client if you understand why I am saying what I am saying, and two, it's for my own ego, it will be my legacy when I pass on to the next world, hopefully many, many years from now.

5.16.6 Emotional aspects of the craft

J: Has a big loss ever made you doubt the validity of technical analysis?

SW: No, because I'll never, ever, ever, take a big loss, I'd rather take 4 or 5 small whipsaws or small losses. Many years ago, maybe forty years ago when I was first starting out, I had a big loss or two, but that didn't make me doubt technical analysis. That made me grow and realize how stupid I was at that point when I was a young kid hoping and waiting for a turnaround. And, as I write in my book, all the negatives that have come through my life made me grow, and that's what I think all of us should do. For 30-35 years, I've never taken a big loss. I'll quickly sell a losing position, and if we are wrong, there is always another "street car coming along," and we'll make it up next time. I am amazed when I see what happens to a lot of these big mutual funds and hedge funds, even today, to some of the ones with poor discipline. Often, when I review portfolios, I'll see a client would have had a terrific year, but he had two or three tremendous losses that wiped out 10 or 15 good things he did. To me, that's silly, I do it the opposite way. If you have one or two big wins, that will wipe out 3 or 5 or 6 little losses. That's one of the keys to my success – I will never take a big loss. I think that only validates technical analysis because it shows that if you follow the system, it's impossible to have a big loss. If you are a fundamentalist, and you believe in your product or company, you are inclined to think: it's going down, it's cheaper, I am going to average down and buy more. If you follow my system, it's impossible to do that. I'll never make a recommendation without a stop loss, but if I said I am buying it at about 40, and it breaks below say 37, I am out of here. If you look at the chart at some point, there is no way that you should, as some people do, carry a stock from 40 to 5. It would be impossible to do that because, when you break the moving average and support, you would realize you should have never been in there. That's one of the things that I am very proud of in my system. If you take a look at the worst events of the last few years, things like Enron, K-Mart, every one of them gave a sell relatively close to the high, and we avoided at least 80-90 percent of the devastating decline. Just look at how many pension funds across the country were buying Enron, while we had it graded stage 4 the whole way down.

J: To what extent do your emotions interfere with your craft? How has that changed since you first started?

SW: That's a great question. We are all emotional. Some people think, oh, you are an analyst, you've learned to control emotions. As far as I am concerned, we are human beings and we are always going to be emotional. This is another way that my system evolved. I am a very emotional person, and I used to call it a problem. Now I've learned that it's important to accept what we are, to accept our emotions. Each thing that is a problem should be incorporated into the system and turned into a positive. That's how I developed my stop-loss system. When I am getting into a stock, I decide where I am going to take a loss and get out, and when I am going to buy more. It's all diagrammed for me, so even though I can be as emotional as the next person, my system separates the emotions from my

decision-making process. Even though I am still emotional, the decision making is automatic.

J: How has the extent to which your emotions interfere with your craft changed since you first started?

SW: I guess my emotions interfere less now, as I've become more confident. I guess that's the only thing that has changed. I am still the same person, but when I was young and starting out, I did not have the same level of confidence, because I didn't have the same experience as I do at this point. I would just say I know that everybody is going to be wrong sometime, so if I am wrong, that's OK. And I know over the years I've had a good batting average, so that's OK. I also know where I am going to exit, so I know I am in control. I think that all those things make me not be as emotional. And that's why my system is durable, because the stops will take the emotion out for me. But, I am telling you, I still have my emotions, we all do, that's the reality.

J: According to Joseph de la Vega "every speculator seems to have two bodies so that astonished observers see a human being fighting himself[29]*." To what extent is this statement true in your case?*

SW: Part of the thing that makes me feel confident is that I am always in gear with my indicators and with the chart. That's really what I am trying to do. I am trying to be in harmony with what the market is telling me. I had a logo at the top of the *Professional Tape Reader* that says "The Tape Tells All," and I really believe in that. If you have two bodies in conflict, you are not listening to what your system is telling you. I am not in conflict. I guess the only time I would be in conflict is when I wasn't looking at my system. But, since long ago, my system and charts are guiding me, and I am in no conflict.

5.16.7 The role of creativity

J: What role does creativity play in technical analysis?

SW: I would say the only role it plays is when I develop new indicators, in coming up with new methodology, like my stage analysis. But when it comes to being a practitioner, creativity can actually be a hindrance. In executing, you want to be pragmatic and robotic, not creative. Sometimes I'll get into a more creative state, things will suddenly hit me, and I'll come up with a new indicator. I'll be thinking, let's try this, let's see how that works. That's different. That's OK when what I am doing is theoretical. Obviously, I've been at that stage where I've developed a lot of new things in technical analysis. But when I am actually trading, there is no creativity, it's all cut and dry, it's about following the game plan.

[29]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office. Massachusetts: 1959. p. 22.

J: We've talked a little bit before about the talent for technical analysis. Could you define this talent for technical analysis?

SW: Having a numerical kind of mind certainly helps. I'll remember that IBM is going to break out right above 95. It's also important to have a certain kind of personality. I am very open. Somebody who is going to be straight down the middle of the road is going to follow the tried and true conventional wisdom, rather than advocate technical analysis. My personality is one of my strengths. I'll give things a try. So, I said, hey, let me give technical analysis a try. It certainly did it for me, I've seen it work. I know a lot of people who would never give it a try. They say, how could squiggles and wiggles on a chart be as good as getting an economics degree? The same way I am a big advocate of technical analysis, I am a big advocate of supplements and vitamins. I know a lot people don't agree. But, again, I've tried it and I've seen it work – I am 62, but I jog every day and I am in great shape. I am open to trying different things. So I think it's a matter of a talent, it's a matter also of a personality type. Those who have the talent, but have a different kind of a personality, will probably end up being a banker or a fundamentalist.

J: In your opinion, will the artificial intelligence ever be sophisticated enough to replace a human technical analyst? If not, why not? If yes, please explain.

SW: I can be right 7 or 7.5 out of ten times, and if somebody shows me an artificial intelligence that's right 8.5 out of 10, I'll say, hey, it's doing even better job than me. But until someone shows it to me, until someone shows me a consistent batting average, I would be dubious. I know it can be helpful, but I would be doubtful, because, as you and I spoke before, there is a little bit of a "feel" in the practice of technical analysis, and those things are so cut and dry. In fact, I've done certain experiments where I have tried certain systems, tried to quantify technical analysis, and I got some interesting results. I've seen a lot of systems that can give me printouts, and I'll look at them and say, this is a good chart or I don't really like this chart. Again, it becomes a little bit intuitive, where I say this feels best. So, given the intuitive side of technical analysis, I don't think artificial intelligence can ever replace a human analyst. I guess it can be a help, a starting point, but I don't use it, that's not me.

5.16.8 Luck, astrology, etc.

J: What is the role of luck in technical analysis?

SW: I kid around and say the harder I work the luckier I get. True, on any one trade when the stock breaks out and looks terrific, while it's likely to go up, you wouldn't know in advance that it's going to be a really big winner (such as a takeover situation). That has a little bit of luck involved in it. But, I think over time, good luck and bad luck will even out.

So luck to me plays no part in technical analysis. On any one trade there could be a little element of good luck or bad luck, but not if you start looking over time, over a year, over 5 years. I used the analogy before with Joe Montana and Dan Marino – if you look over time, they may have been lucky on one play where the guy didn't intercept the ball, but that did not make their careers.

J: Do you think that inclusion of astrology in technical analysis undermines the credibility of the craft?

SW: That's for me a two part answer. On one hand, from a public relations point of view, I think it does. On the other hand, I've seen some people, make some very good calls, using astrology. I am the ultimate pragmatist. When I used to do my *Professional Tape Reader*, in the back of each issue I would list 50 indicators, which comprised my weight of the evidence. I always used to kid around and say, if I could drop a pin into the Wall Street Journal and it gave me a good answer 8 out of 10 times, I would add it into my weight of evidence. The same thing is true here. I don't use astrology and it seems a little bit weird, but if it gives enough good calls and it seems to work, then, why not? So I think the answer is two fold. If it works for somebody, let them use it, but from a public relations point of view, even if it does pragmatically work, I think there is no doubt that it does undermine credibility.

J: There are technicians who believe that structures such as the Elliott Wave, Gann's natural order postulates, Fibonacci numbers, etc. underlie the market action. Some prominent technicians have an enormous amount of faith in these theories, even though none of them have been scientifically proven. What is your opinion?

SW: Again, I am not an expert on Gann, I know they have their angles, and I am certainly not an expert on the Elliott Wave, even though I know the wave counts. I don't use these techniques, but I am not going to put them down. I don't think their inclusion in technical analysis undermines anything. I know Bob Prechter has certainly been successful in a lot of market calls using Elliott Wave. So I would say if something works for you, I have no problem with using it. I don't use it. I am not a big proponent of Elliott, Fibonacci, or Gann, but I am certainly not going to put them down, I don't know enough about it, I try to stick to what I use and know.

5.16.9 Level of conviction

J: Have you always been convinced about the validity of technical analysis?

SW: Absolutely. It was a growing conviction. In the beginning, I was even a little skeptical, and then, as I started to use it, it certainly seemed more than random. As I got more proficient and better and better at it, I could start to make some really good calls. It just was a growing level of conviction. I went from, there may be something to this, to, I know there

is something to this, but at the same time knowing its limitations. There are limitations to technical analysis, just like there are limitations to fundamental analysis. And just as it is a problem when people don't believe in technical analysis at all, it is a problem when they believe in it all the way, without being aware of its limitations. Nothing is going to be fool proof. As you and I spoke earlier, that's why it's very important to know to exit when something isn't functioning according to the game plan, because nothing is ever going to be perfect.

J: Did the lack of credit many academicians give to technical analysis ever discourage you?

SW: I would say it did when I was young. Now, I laugh at it. I think you and I had this chat before when we were talking. I really think it's OK. When I was very young, I wanted everybody to know the validity of it, but not any more. That's because, as I told you before, if we can convince everybody to go to one side of the ship, the ship is going to tip over, we are not going to have a functioning market. So, pragmatically, it's good that they don't believe in it. I find it almost amusing now, because I've seen all of these academic types come along and say things, and I just think to myself, they obviously don't know what they are talking about, and they are obviously not trading in real markets, so they wouldn't know it. Among the people who really know how to trade markets, among the people who've traded commodities, I don't know of any successful traders who, maybe not to the degree that Stan Weinstein does, but at least to some degree, don't acknowledge that charts and trends are helpful. So, now I find those people who start pontificating from an academic point of view amusing, whereas, yes, when I was 20 years old I wanted everybody to know the validity of it; it bothered me then, it doesn't bother me at all now.

J: What, in your opinion, is the best proof of the validity of technical analysis?

SW: I think the best proof is in the batting average. I don't want to be my own PR agent here, but anyone who has followed my work knows that within a matter of sometimes a day, sometimes weeks, we've caught, over the past 4 decades, every major bull and bear market top. I remember that bottom day in mid-March, 2003, we turned bullish on that day, after having been long term bearish for three years. And, again, believe me, there have been some misses too, but there have been so many good market calls. Just looking at my own case over the last year, even though I've been bullish on the market, I've seen so many charts breaking out in the secondary, smaller areas. I remember writing the line a million times that the small caps would fully outperform the big caps, and, even though the S&P and the Dow are starting to catch up now, over the last 10 months you know how much better the small caps have done, in general, than the large caps? The areas we've been bullish on have worked, the areas we haven't liked haven't worked. To me, the proof is in the pudding. Again, don't make it sound like anything is infallible, because nothing is, but the fact that so many good market calls, so many individual stocks have worked must be more than random.

I think that's it. I have so many clients – you can fool some of the people some of the time, you can't fool them all of the time. And the fact that so many people are willing to pay my fee for me is a validation of technical analysis.

J: Did you find that your experience with technical analysis contradicted statements made in books? Did that ever discourage you?

SW: I wouldn't say that. I am trying to think because I've read so many books over the years, I haven't read so many lately, but I've read so many books, and I wouldn't say that what I've read has contradicted my experience. But, what I would say is that some people, who call themselves technicians, make statements that don't fit in with what I would follow. This goes back to what I said about academics not giving credit to technical analysis – it doesn't bother me because they just don't know. What bothers me really more is when I see somebody who I think is a poor proponent of technical analysis and there are many of them on TV. I'll see them make statements either about the markets or individual stocks, where I don't think that the chart or my system justifies the statement they are making. That I find somewhat upsetting because that, I think, goes and reflects on all of us. So some of the people, who are poor practitioners of technical analysis, do bother me, and I certainly would contradict them. But I honestly don't remember reading statements in the serious literature that I would contradict. Most people who have written about technical analysis know at least the basic tenets about trend following, volume confirmations, etc.

J: Does the fact that in technical analysis there are no hard and fast rules and no proven theories ever bother you?

SW: Not at all. This comes back to one of the early statements I made in my interview. I said that, although there are certain hard and fast rules in my system, for me, technical analysis is still more an art than a science. That's why it's very difficult to quantify it, especially when people come in and they try to put things in computers and check them out. Another thing you have to realize is that so many people practice it in different ways. It's kind of like if you went to see different doctors, one doctor specializes in one thing, another doctor specializes in something else. There are a lot of different practitioners of technical analysis, as you alluded to. For example, what the Elliott people do has very little to do with my kind of work, with chart analysis, but I respect anything that can make profit above random calls, I don't care if it's Gann, I don't care if it's Elliott, or Fibonacci, anything that you can show me that works. I am not trying to go in competition with another system. Over many years, I've defined what for me worked and what didn't work. I am very happy about my little system and the way it evolved. It made me assured, it has done nice things for me, so I am very happy with it.

J: So, you do think that it is more art than science?

SW: I think that it's certainly equal part art and science. To some degree it shouldn't be, but I think that it is. And that's why I say I see on TV many people making statements that don't fit in with what I would follow. There is no doubt that it's somewhat of an art, because everybody is not practicing it the exact same way. But I do think there are some basic things, and I know that Market Technicians Association has done a good job putting together a test, to test people and give them certification, which I think is a start in the right direction of trying to make it a little bit more of a science, and a little bit less of an art. It's always going to be an art. I can put two people in a room and tell them to follow the same rules, and one person will have a little bit more aptitude and a little bit more of a feel. That person will be a little bit better than somebody who just isn't going to buy a bad stock or sell a good stock, but who is not maybe quite as good with it. So I think there is a certain element of art in it. Obviously, I wouldn't respect a technician who says that a stock that's trading below its long term moving average is a good stock. That's ridiculous. I think there are certain rules that I think we all should be able to agree on.

J: But the way you in particular practice it, it's more of a science than it is an art?

SW: To me I think it is, though I think discipline might be a better word than science. I honestly believe that, for me, the largest part of technical analysis is a "science," a set of rules, a discipline. I think there is probably 10 or 15 percent that's an art or the feel added that you bring in. I've taught and mentored so many people who now do it the exact way I taught them. So many people have read my book now and do follow it. For people who follow the Stan Weinstein method, I think it's much more science and much less art. But, there is no doubt in my mind that if I brought 100 people in here, the top 25 will be much better than the bottom 25. That's why it's a little bit of an art.

J: Do you believe that technical analysis works even when applied to data other than the market action data (e.g. the weather or the river flow data)? If yes, how is that possible? If no, please explain.

SW: I don't know very much about that, I try to stick to things that I know about. I think technical analysis would work on anything that trades with a trend, or on anything that has some kind of long trends over time. Here is where cycles come in. I use cycles. They are much less important part of my work, but I do respect cycles. You see the 4-year presidential cycle, which is there. I know there is something there, but if we are talking about river flow or something, I don't know that stuff. If it's some kind of trend over time, maybe it could work. I always use the analogy, I say, I am like a doctor. Even without ever meeting you, I can say, OK, I am going to give you a series of tests, I want to run a cardiogram on you, I want to do blood tests. I can do a lot tests without having met you or spoken to you, and after I get test results, I can have a good idea of your health, or your lack thereof, and people won't think that I am strange or that I am using magic or astrology. Similarly, with technical analysis, I am measuring how strong or how healthy the buyers

are versus the sellers. There is always a tug of war going on in the market place. That's why bonds and commodities are much more sensible choice for technical analysis than river flows. There is a definite buying and selling going on. People's opinions create a tug of war. And I am measuring which side is healthier or stronger, the buyers or the sellers. So I am doing cardiograms on the market and cardiograms on individual stocks. It won't be perfect, just like, if we took a cardiogram of 100 people, I am sure you can find one person that has a good cardiogram, but that will walk out of the doctor's office and suddenly drop dead. But if we took people with the 10 best cardiograms out of these 100 people, I think that they would live longer than those with the 10 most unhealthy cardiograms. You would find a correlation there. The same thing is true in the market. Any one chart, any one breakout can be false, but what we are really doing is looking at cardiograms of a lot of breakouts versus a lot of unhealthy breakdowns. We are looking at the probabilities, and we are going to see over time that more healthy cardiograms are going to work fine, and the more unhealthy cardiograms are going to go down, and it all makes sense to me the same way it makes sense in the doctor's office.

J: I am also curious as to what extent do technical indicators capture the fundamentals that are present in the financial markets and the market action data, but that are not present in other kinds of data?

SW: That's a good question. Though my approach is technical, I am not anti-fundamental. I really think in most cases it's the fundamentals that are pulling my chart, they are like the engine pulling my car. So the fundamentals certainly do matter. There have been many times that I bought a stock which then broke out, and I have a chapter in my book about signs to watch for – there are very, very good patterns that often lead to stock takeovers. Now it's not as valid today as it was 20 years ago, people are being much more careful because of the SEC, and the information is not leaking out as much as it did in the old days. Then, a lot of times I'd recommend a stock, which in 4 to 6 weeks would be taken over, and I honestly didn't know anything about it. But we would be picking something up, we would be onto something. And, you are right, I think a lot of times we are picking up something fundamental on the technical screen, without really knowing what it is. If a stock, which on average trades 10,000 shares a day in the range between 8 and 10, suddenly breaks out above its resistance at 10, and if its volume increases 10-fold from 10,000 to 100,000, I don't know what's going on, but something positive is going on. And it's amazing in how many of these cases they announce a takeover or a new product. Somebody knows something, and people talk and act on fundamentals. I think what you said is valid – I think we are often picking up some fundamental news that somebody knows about, but that's not yet public.

J: To what extent are the technical patterns or indicators just measuring devices, so that they would work on other kinds of data?

SW: I think technical analysis works best in measuring supply and demand. You can do trend analysis or run moving averages on other kinds of data, and you'll be able to detect certain trend changes, but I don't think you'll get as high a correlation of success as you will on the stock market or the commodity market data. As you said, there are fundamental things going on every day, people casting their votes, and we are measuring who is voting stronger, the buyers or the sellers. When something radical changes in the equation, it may turn out that it's the fundamentals. Or it may just be market psychology, where people may suddenly start saying, 'oh, I want to buy bio-technology stocks,' while nothing may change fundamentally with the company. So we are measuring something that is truly measurable in terms of supply and demand, and in terms of fear and greed and the market psychology. I don't think it's as valid with other kinds of data. Yes, I can use moving averages, I can see where things are changing, but I don't think it's as valid as it is in a dynamic market place, where opinions every day are being voted upon, volume-wise and price-wise. Again, I haven't studied the effectiveness of technical analysis on other kinds of data; it's ridiculous for me to talk about what I don't know about. So I would just say that it may be measuring some trends, because if there are some kind of trends that evolve over time, maybe you will see some patterns. On a scale 1 to 10, 10 being the best, I think technical analysis works best, at 10, in a dynamic marketplace, in an auction place, where votes are being made and where the supply and demand are being changed every day. We haven't measured weather so I don't want to be ignorant and give an opinion about something that I don't know about. My guess is that, even if applying technical analysis to weather, moon or sun spots, or some other data that has some kind of cycles over time, it has some kind of validity, the validity will be more of a 2 or a 3 there, rather than a 10.

5.16.10 Lifestyle

J: Are you sufficiently convinced in the ability of technical analysis to forecast future price moves so that you can live without stress?

SW: Absolutely, but I want to tell you something: anybody who is in the market place and says they have no stress is either a liar or a freak. We all have stress in the market, but I think technical analysis lowers the level of stress. You have to know that the market is always subject to change. I was kidding around before in the interview when I said I am ready to change on the next tick. But it certainly lowers my stress level, even if something is going wrong. This is very much unlike fundamental analysis, where, unless you found out the product doesn't work, you have nothing to hang your hat on when the sales are going bad. I have all these guidelines where I start saying, 'well up to this point it is a normal pullback, I am OK with it; oh, now it's starting to violate what I thought was a normal correction, I am going to take some of that position off; wow, now it's gotten terrible, and it's breaking my long-term moving averages, I am out of here!' So I am not going to lie to you and tell you I have no stress. Anybody that's in the market has stress. But it certainly lowers my stress and it makes me feel that I am somewhat in control, because I've got guide-

lines even if things are going against me. On the other hand, if I am a fundamentalist, when things are going against me, I'll probably just be averaging down in a bad position and buying more of a bad stock. Technical analysis gives us the discipline that lowers the stress level.

J: Could you describe your working day?

SW: Crazy – that would be the best one word description. I love what I do and I have a passion for it. In fact, you asked me before about the things that made me successful. One thing that I left out was my passion for it. I am passionate about it. Believe me, I am not turning the money away, I do like it, going on vacations, have nice cars, but I love doing it and I plan to do it for the rest of my life. What I do now is I compromise with my wife, whereas up till four years ago I was totally, totally hectic – I had the *Professional Tape Reader*, which was a twice monthly newsletter for the public, and I had a weekly hotline and all kinds of reports. And in addition to the *Professional Tape Reader*, I did a lot of radio and TV interviews, I used to do seminars in the old days, teaching classes. So I compromised with my wife Rita, and as of four years ago, I stopped all of that. Just occasionally, I'll do TV, like the other day with Paul Kangas on the Nightly Business Report. I do very little of radio and TV any more, I do no seminars any more, I don't do the *Professional Tape Reader* as of four years ago. And I strictly now have only my institutional service, which is called Global Trend Alert, and my day goes like this. I work late at night. When I hang up now (around 7pm), I am going to go jogging, eat dinner. I'll probably go out for a movie with my wife. Then late at night, I'll come back here. I work very weird hours. I'll come back here probably at about 10:30 or 11 o'clock at night and I'll work till 2 in the morning and go through charts. In the old days I used to go through all the charts every night. But now I have staff that I've taught to go through our 2000+ charts each night and condense it down to the best and worst charts for me to look at. And I go through those and pick the few I like best. Here is where I think a little bit of an art comes in, because every one that they pick, they know what they are doing, is going to be a good chart or a bad chart. So then, from the ones that they pick, I'll go through tonight, and I'll pick out maybe the best 10, the 10 that I love the best, and 2 or 3 short sales that I love the best. Then, late at night, I'll be calling my clients and leaving them voice mail messages, for things that some of them should be doing tomorrow. And I'll go to sleep probably at about 2 or 2:30 in the morning. I need my 8 hours of sleep, so I'll get up at about 10 or 10:30 in the morning, I'll shower, I'll go to the office, which is right above my house, I'll be in the office by 11 o'clock in the morning, and the day will start again. And all day long, I'll be talking to clients who pay to interface with me, whereas in the old days, when I only had the *Tape Reader*, nobody spoke with me. That's really what my day is like – it's being on the firing line during the day, consulting and answering questions, and, at night, researching and getting ready for the next day.

J: How many hours do you spend practicing technical analysis?

SW: OK, let's think through it together. On an average day, I am working from 11

in the morning till 6 at night, so there are 7 hours there. Then, I am going to be in the office very late for 3 hours, from 11 pm to 2 am. So that's 10 hours a day. Then (I know this is one of the things my wife doesn't love) if you are my client, you'll get each weekend from me my updated fax or email. I do that every Friday night. That takes about 8 hours on Friday night and another 6 or 7 hours on Saturday, so that report takes 15 hours to put out. Once a month, I also put out a 64 page monthly issue. That will take the rest of Saturday and the whole day Sunday. It will get done at 12 or 1 o'clock Sunday night, it will be printed early Monday morning, then sent to everybody. So on an average day, it's certainly plus or minus 10 hours a day of technical analysis. I think that's like in any other discipline – if somebody, like an Arnold Schwarzenegger, a body builder, at some point stopped lifting weights, they'd get flabby. But, obviously, when I go on vacation, I don't work 10 hours a day. I will be going away next week – my wife and I are going on a cruise – and even when I am on a cruise for 10 days, although in that 10-day period I won't be speaking with my clients, I will still be putting out my weekend report, even from the boat. My staff will send me the charts, and each night I'll spend two hours when I am on vacation, going through the charts, getting my feel, and then I'll be emailing them all the info they need to put the report together. So even when I am on vacation, I never miss a weekend issue, I haven't missed it in years and I hopefully never will, but when I am on vacation, I spend 2 rather than 10 hours. I think there is that minimal amount that you have to do every day, otherwise you are loosing the continuity and the feel in the market.

J: Is it something that you feel you should do, or do you enjoy doing it even when you are on vacation?

SW: I love it. You know, the only thing that I love more is my wife, my kids, and my grandkids. I love it, and that's why I am doing it now. Some people ask me, 'Stan, why do you still do it?' I know some people find their job a bore, but I love mine.

J: Is the market always on your mind, even if you are not officially practicing technical analysis, say when you are just relaxing?

SW: The market is always on my mind, it's always going to be there. But, obviously, like tonight when I watch the movies, I'll forget about it for a little bit. But yes, it's always there. To use a simple-minded analogy, it's like if you watched a soap opera on TV – if you miss it for several weeks, you kind of loose the continuity of the program. I think it's the same way with the market. You have to watch it each day, there is always a hint being given. If you don't watch the hints each day, you kind of lose the continuity and the feel. Like I said, it's a passion for me, but I am very family oriented, that's why I have my office on the top of the house, even through all of my kids have grown up, I have grandchildren. But when our kids were growing up, I would be doing the *Professional Tape Reader*, and then I would go downstairs. I have three daughters, I would talk to them, if they had a problem, like if they broke up with their boyfriend, I'd always be there, always in their life, then I'll

come back later at night and work. So I always found a way to work the technical analysis and my job in with my life. After my wife, my kids, and my grandkids, it's the next love I have. It's a terrific thing. I think there are so many people who hate their job, the fact that I can be paid for this, and that it buys me the nice cars and the trips, I think is wonderful.

J: In his book, Confusion de Confusiones, Joseph de la Vega wrote:

> When the speculators talk, they talk shares; when they run an errand, the shares make them do so; when they stand still, the shares act like a rein; when they look at something, it is shares that they see; when they think hard, the shares provide content of their thoughts; if they eat, the shares are their food; if they meditate or study, they think of the shares; in their fever fantasies, they are occupied with shares; and even on the death bed, their last worries are the shares[30].

Would you agree with de la Vega? To what extent does your trading control your life?

SW: I am not going to lie and say it doesn't. There is some truth to what you just read. I think that the secret in the market and in life, is trying to keep the balance. And that's why I said, even though I know I have a strong ego, I try to keep it in balance. You have to keep it in balance, or it's going to get you. It's a big part of me, but rather than it controlling me, I like to think that I control it. So I think it's very important that my wife and I program the whole year ahead of time, all of our vacations. Every three months or so, we take a vacation. I think that's very important, because otherwise what you just read can be true. And I am not going to lie and say there isn't a little bit of that in me, I think there probably is, but it certainly isn't the only thing. You have to watch out that it doesn't take you over, which I think it could. I've learned that there are only certain things that are really important to me. My most important thing is my wife, my family, my kids, and my grandkids, then the few other loves that I have. I think it's important to develop a few other loves. I have a few other loves, things that I care about, that I am passionate about. I am very passionate about sports. Even in the middle of doing the issue, if the Miami Dolphins are going to play, I would never miss it. I never miss a Miami Dolphin football game. I think it's important, otherwise, like you said, you can become single minded. Also, I love traveling, I've traveled the world, so I make sure to do that. On a scale from 1 to 10, what you described is a person for whom it's a 10, and for me I think it's probably a 4 or a 5. But I do have to fight it and make sure I do other things, so that's why I also work out and exercise every day. The market is a very, very big part of my life, but there are other things in my life that are important, too. You've got to do other things, otherwise what you just described can take your life over. Truth to tell, at the end of the day, when we pass onto the next world, it all only means so much, and I think much more than the money, or even your job, is the relationships that you've made. So I think I have got a little bit of that quote in me, but I am aware of it. So, again, just like in developing my system, when I became

[30]De la Vega, Joseph. *Confusion de Confusiones.* Harvard University Printing Office; Massachusetts: 1959. p. 22.

aware that I wasn't paying enough attention to the market, I got the market indicators in there, and when I became aware of my emotions, I developed my stop-loss system. I am aware that what you just read is an extreme that can take over one's life, but I don't think it's going to take over mine. Once you are aware of the problem, I think you can counteract it.

J: Did you always have this kind of balance, or did you have to work at it?

SW: No, I did not. I had to really work at it. I have to thank my wife, Rita, big time. She has definitely helped keep balance. And I also think that you mellow as you go through life. Life is a journey, and if you get anything from the journey, you start to learn. When I was starting out, when I was 20 years old, all we wanted was to set the world on fire, and all we were thinking about was making trillions of dollars. I really don't think I had as good of a balance there, although I always did have the family values. But as you go through life, you see bad things happen to some friends, and you start to realize what's really important in life, and, for me, it's all about my wife and my kids, I have a terrific family. Just seeing the good and the bad that can happen, you start to realize what's really important in life. We've had some terrific things going on here, and we've had some hard times. When you put it all together, that's what the journey teaches you, if you are open. That openness is, I like to think, one of my strengths. That same openness is one of the things that made me very, very good at technical analysis – I am always ready to be wrong and grow. I am the same way in life, I've made my mistakes and I've grown. I always try to come down in the middle. The same thing in the market, I try to move incrementally. I've seen some people, on Monday they're bullish, on Tuesday they are bearish. To me, that's ridiculous. If you start to follow the market properly, it should be a slow evolving process. And life should be the same way, it should be an evolving thing. We need to learn from our mistakes. I think that both life and the market are growth processes. I've seen people who are talented marketwise, but haven't been as successful as they should have been. It's usually because they don't live a balanced, disciplined life. I've very rarely seen somebody who has a crazy life and is very successful in the market. I think the market will test every strength and weakness we have. If you are open to learn to see what your strengths and weaknesses are, you'll grow in life, and that's what the journey should be about.

5.16.11 Advice

J: What kind of formal education is most compatible with the profession of technical analysis?

SW: It's a funny thing. This is why I think a lot of people will look down their nose at technical analysis, but I don't think it takes a whole lot of formal education; it takes studying it and, more importantly, doing it. This a silly analogy, but what kind of formal education does it take to become a good tennis player? It takes going out and practicing it. First you need a good teacher, who is going to teach you the basics, and then it's up to each of us, and we all have limited talents, to take that, practice, and make ourselves the best that we

can be. It's the same with technical analysis. I could teach you all the different disciplines I know and get you to a certain point, but then it's up to you to develop your feel. It's almost like the "aha!" feeling – you go, "aha, now I know what he is talking about!" I don't think it takes a lot of formal education. It doesn't take an economics degree to be successful in the market place. I can think of several very prominent, very famous economists, who have made disastrous market calls, because they are talking about the economy, which we know is supposed to be a discounting mechanism, as we all learn in Econ 101. So they'll be talking about the present state of the economy, how the unemployment rate is still high, and they won't realize that, when the market turned up in March, 2003, it was looking ahead, while the fundamentals were still bad, and when I issue my next sell signal, you are going to see glowing fundamentals, the unemployment rate will be dropping, everything will be terrific, and the economists will say, 'everything is great,' and when the market starts down, they'll say, 'it doesn't make any sense.' It's a very interesting game, and that's why I love it. It's amazing, even people who should know better, often don't know better.

J: You mentioned that it is important to have a good teacher when you are studying technical analysis. When you were studying technical analysis, did you have a teacher or a mentor?

SW: I had no mentor. I wish I had. It would have been easier, I could have gotten where I got faster. I wish I had a Stan Senior and I could have been a Stan Junior. I didn't have it. My dad loved the market, but he was a typical fundamentalist, and he got me interested in the market. He used to read the paper and say, 'that's a good company, that's a bad company,' but he was never fantastically successful in the market, and so I just had to learn everything myself, again, turning the negative into a positive along the way. I started out going down the traditional path. I remember looking at very famous fundamental services that are still around today, taking their recommendations, and I lost a lot of money. And that's where the negative turned into a positive for me. I went to a college library, got the Edwards and Magee book, and started reading it. Nobody mentored me. What I've learned I've learned over many, many years, doing it for a long, long time, and the system has evolved. And I feel good that I have mentored so many people. Like I was saying earlier, the same way I am disciplined in the market, I am disciplined in life. Hopefully I am in very good shape – I take terrific care of myself, I work out every day, take vitamins. So I kid around with my wife and say, I want to do this till I am 120, then I am going to sell and go to sleep. I want to do this forever! I think that's it, I love what I am doing. Part of my legacy is that book that I wrote, that was my contribution to the literature. That took a hard year out of my life, and Rita was a big part of it, because I am probably the only author in America who doesn't type. I'd do it in longhand, I'd dictate it, and she would be doing it in those days with a word processor each day. And even though I sold a whole lot of books, I didn't do it just for the dollars and the cents. I did it because, one, it opened a lot of doors for me and it was a nice thing, but two, I also feel good about how many letters I've gotten from people telling me how it has changed their life. Even people I haven't met, I know I've mentored a lot of them through my book, and that's good to know.

J: What advice would you give to technical analysis students? What is the key to success?

SW: I think the key to success consists of two things: can do and will do. What that means is, first make sure you have an aptitude towards it. If you have an aptitude for numbers and patterns, that's a start. That's the can do. The will do is the passion. You have to have a bit of a passion for it. I am sure someone, for whom it is just a job, can reach a certain level of success, but there is no doubt in my mind that that's not going to be the same level of success as somebody else who is a little "nutty" like me. I think that anybody who really becomes truly successful in an area, and I don't care if it's Michael Jordan playing basketball, is very single minded in what they do. You just have to learn to balance it, so that it only takes a half of your life. But if you just feel like, "I have to go look at the charts tonight," I don't think you are going to be as successful. So I think the key would be that you have an aptitude, you really like doing it, and you are not looking for shortcuts. And the last thing I would say is that you need to learn the discipline. I used to keep up a diary, that's how my system evolved. I used to write down the trades that didn't work and the ones that did work, and I started to see patterns form about the things that I was doing right or doing wrong. People have to work out their own discipline and system and then follow it. I think the most important thing, which is not going to make you totally stress free, but which is going to lower your stress, is that you say to yourself, 'I am going to use this game plan, this is how I am going to go about it, and I am going to spend some serious time on it.' You are going against the best brains and the best computers on Wall Street. If somebody is not serious and they think, 'I am going to spend 15 minutes on a weekend looking at a couple of charts,' they are not going to be a real serious player. But if they are a serious student, and they are willing to sweat it, I think it could be great for them.

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